



WST2

Washington State Technology Transfer



2001 Technology Expo pg **10**

MUTCD Millenium Edition pg **28**

Urban Roadway Design pg **45**



**Washington State
Department of Transportation**

A Technical Newsletter of
the Washington State Department of Transportation (WSDOT) and the Local Technical Assistance Program (LTAP)
Issue 72, Fall 2001

Washington State Technology Transfer

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<http://www.wsdot.wa.gov/TA/T2Center/T2Bulletin-archives/T2Bulletin.html>

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*Dan Sunde
Director of Technology Transfer
WST2 Center*

"E Pluribus Unum"...Out of many, one.

From the staff of the WST2 Center we extend our deepest sympathies to the families and friends of the victims of the September 11th terrorist attack in New York City. Our thoughts and prayers are with you.

Over these past weeks it's been inspiring to see our country live up to its motto, uniting as one through this tragedy, by caring for those who have suffered tremendous loss and supporting the nation's efforts to take the necessary steps to address the terrorist problem.

May each of us continue to support each other through these difficult times and beyond, and remember that it is our unity in our diversity that has made the United States unique among nations.

A handwritten signature in dark ink, appearing to read "Dan".

Dan

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The Local Technical Assistance Program (LTAP) is a national program financed by the Federal Highway Administration (FHWA) and individual state transportation departments. Administered through Technology Transfer (T2) Centers in each state, LTAP bridges the gap between research and practice by translating state-of-the-art technology into practical application for use by local agency transportation personnel.

Any opinions, findings, conclusions or recommendations presented in this newsletter are those of the authors and do not necessarily reflect the views of WSDOT or FHWA. All references to proprietary items in this publication are not endorsements of any company or product.

 **Washington State
Department of Transportation**

 **U. S. Department of Transportation
Federal Highway Administration**

WST2 Welcomes Paul Harker New FHWA Traffic and Safety Engineer!



WST2 is pleased to welcome Paul Harker, the new FHWA Washington Division Traffic and Safety Engineer. Paul succeeds Dennis Eckert, who retired April 30th.

Paul comes to the FHWA Olympia Division Office from NHTSA's Region 10 Office in Seattle where he held the position of FHWA Engineer Liaison to NHTSA since March 1999. He has over 13 years of experience in highway safety and traffic operations with a bachelor's degree in Civil Engineering from California PolyTechnical Institute, San Luis Obispo. Paul has a broad background which includes working in the Alaska FHWA Division Office and Office of Highway Safety in Washington D.C. He has been involved with the national pilot of road safety audits.

Paul states he "is looking forward to working with WSDOT's WST2

Center and LTAP to bring the FHWA's state of the art training, technical assistance and transportation technology to meet your needs."

The WST2 Center looks forward to working with Paul, expanding the excellent working relationship we have with the FHWA. Paul is dedicated to expanding Local, State and Federal partnerships to provide continued improvement of services to Local agencies and tribal governments of Washington.

If you need assistance from Paul, give him a call at (360) 753-9552 or email him at Paul.Harker@fhwa.dot.gov. ▲

Time to Nominate Deserving Engineers as NACE "Engineer of the Year"

Each year the NACE Awards Committee reviews nominated individuals for the "Urban Engineer of the Year" and "Rural Engineer of the Year" awards.

- The rules and criteria can be found by visiting the NACE website www.naco.org/affils/nace.
- Click on Programs and Committee and then Engineer of the Year.
- In addition, each NACE Board member has copies of the forms.

We encourage each NACE state affiliate organization to submit its nominations (5 copies) by December 31, 2001 to Tim Von Neida, Chemung County Commissioner of Public Works, 803 Chemung St. Horseheads, NY 14845.

For more information contact Tim at (607) 739-3896 or by email timvon@stny.rr.com. ▲

TRB Transportation Security Webpage Formed To Assist In Nation's Response

*Reprinted from NACE Update,
September 20, 2001 —
Volume 01 Number 20*

The Transportation Research Board (TRB) has established a new webpage on transportation security.



Go to the National Academies web page: <http://www.nas.edu/trb/> under "What's New," byline September 14, 2001 paragraph, click on [view website].

In light of the tragic events of September 11, 2001, enhancing the security of our transportation system is expected to be one of the highest priorities of transportation agencies. TRB and the National Research Council have generated extensive information on this issue in recent years. This website brings together much of this information. Also included are links to

other related websites that contain discussions of issues, actions which can be taken, guidance, and training opportunities. This website, which is being sponsored by the TRB Task Force on Critical Infrastructure Protection (A5T56), will continue to be expanded as more information comes to our attention.

If you have comments or recommendations on other items that should be included in this website, please contact Joedy Cambridge (jcambrid@nas.edu) at TRB. ▲

APWA Disaster Response Website

APWA has developed some website links to resources for information and training on emergency management and disaster response. These different websites give information about natural

disasters as well as man-made/terrorist attacks and have been forwarded to APWA staff by the membership. Go to:

<http://www.apwa.net/PWResponds/index.asp?topic=160> ▲

Environmental News

By Brian Hasselbach,
Environmental Engineer,
WSDOT H&LP

Programmatic Biological Assessment

Highways and Local Programs (H&LP) Operations Office has initiated an effort to investigate the possibility of applying a Programmatic Biological Assessment (PBA) approach to federally funded local agency projects.

David Evans & Associates (DEA) has recently completed a report summarizing the current efforts involving PBAs, with suggested options for local agencies and associated pros and cons of each option. This document is available on H&LP's web page, under the environmental section, at: <http://www.wsdot.wa.gov/TA/Operations/Environmental/pbapage.html>.

In addition, Al King, H&LP Operations Engineer, completed a number of presentations around the state to help educate local agencies on PBAs and the efforts made by DEA.

Help Us Define Our Role In the Programmatic Biological Assessment Process

The above web link also contains a link to a survey that we need you to complete and submit to us. The results of this survey will assist H&LP in identifying the next steps in the Programmatic Biological Assessment effort and defining what the H&LP role should be in the continued effort.

For more information, please contact Al King, H&LP Operations Engineer, at (360) 705-7375 or Brian Hasselbach, H&LP Environmental Engineer, at (360) 705-6975.

Advanced ESA/BA Environmental Workshops

In response to recent inquiries, the WSDOT Environmental Affairs Office and H&LP will be offering an **advanced** version of the *Introduction to ESA/Biological Assessments* training workshops. Early discussions for the course point to the need to have the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) in attendance. The course will likely offer the discussion of three or four actual projects. The instructors will take the participants through each project step-by-step. This format will also allow USFWS and NMFS an opportunity to comment on potential pitfalls, requirements and documentation needs. The course

*The course has been
tentatively scheduled
for spring of 2002.*

has been tentatively scheduled for spring of 2002. Look for more information in the coming months.

Another series of the *Introduction to ESA/Biological Assessments* workshop has not been scheduled as of this time. The feedback received by H&LP consisted mostly of requests for the advanced workshop. However, if you are interested in attending an Introduction to ESA/Biological Assessment workshop, please contact Brian Hasselbach at (360) 705-6975 or hasselb@wsdot.wa.gov. A waiting list is being kept. When enough interested students are identified, a course will be scheduled and dates and locations will be advertised.

Guidance Available

A number of guidance documents have been developed and/or completed over the last couple of months. Here are brief descriptions of three documents, as well as links to them.

1. Analyzing Indirect Effects as part of the Section 7 Consultation Process

Under Section 7 of the Endangered Species Act, federal agencies or their agents are required to analyze the impacts of any federal action on listed and proposed species and their designated habitat. This analysis must include all effects that have the potential to occur, including indirect effects. Indirect effects are those impacts that "are caused by the proposed action and are later in time, but are still reasonably certain to occur." In an effort to add greater clarity to this definition, WSDOT undertook an effort with Office of Community Development (OCD), National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), and a number of local agencies to develop guidance on analyzing indirect effects as part of the Section 7 consultation process. Here is a link to the location showing the results of that coordinated effort:

http://www.wsdot.wa.gov/TA/Operations/Environmental/Indirect_effects_guide_final_5-14.doc



2. EFH and ESA's Section 7 Consultations

Under the Magnuson-Stevens Act, each federal agency must consult with NMFS on any federal action that may adversely affect any essential fish habitat (EFH) identified under the Act. EFH is a separate requirement, defined by a separate act. However, consultations on EFH can be combined with ESA's Section 7 consultations. We have been directed by FHWA to combine the analysis for these two requirements on our federally funded projects.

Listed below are links to NMFS' EFH web page and some guidance documents recently developed by WSDOT's Environmental Affairs Office:

<http://www.nwr.noaa.gov/1habcon/habweb/msa.htm>

<http://www.wsdot.wa.gov/TA/Operations/Environmental/EFHtext.doc>

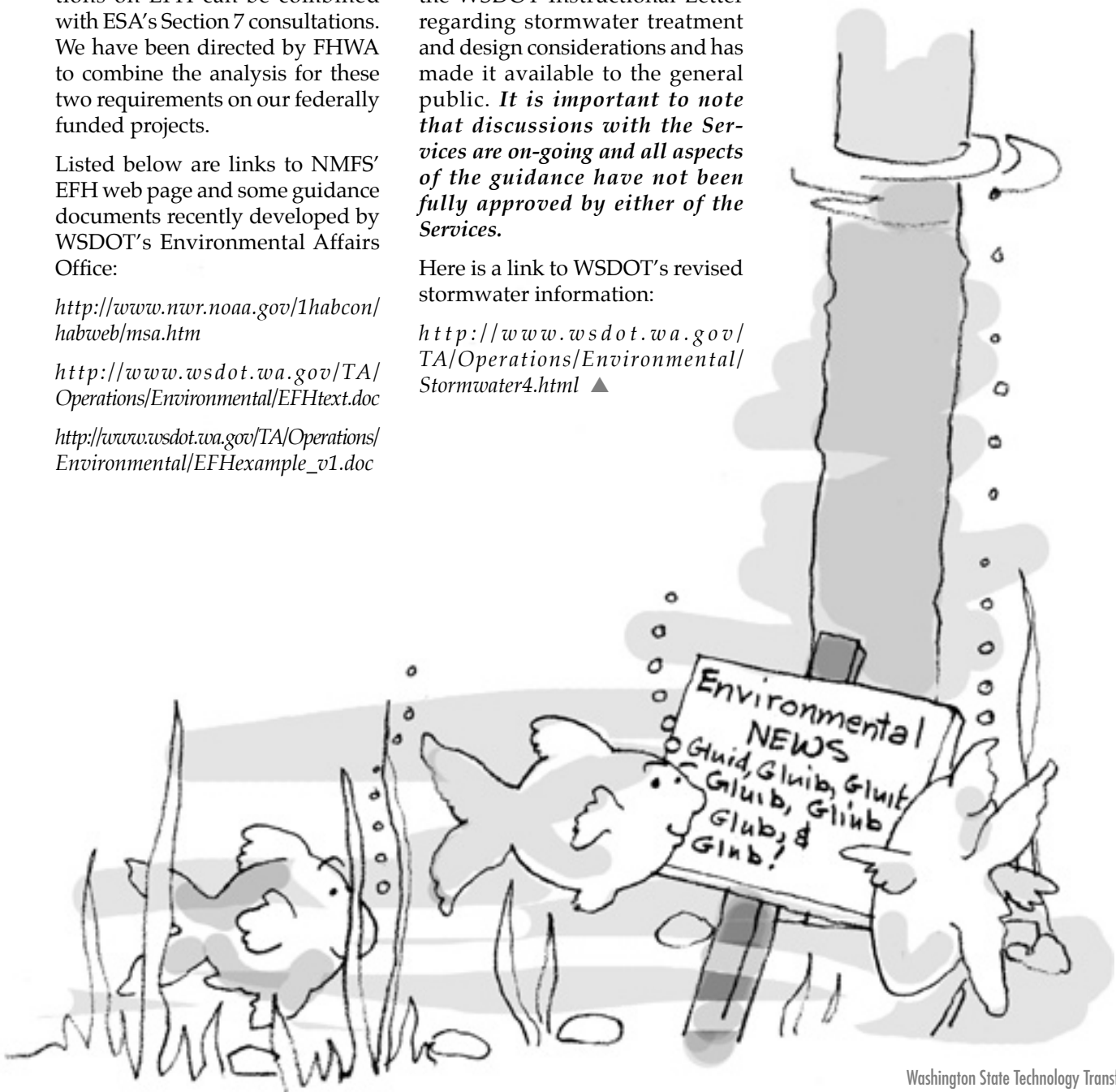
http://www.wsdot.wa.gov/TA/Operations/Environmental/EFHexample_v1.doc

3. WSDOT's Revised Stormwater Information

Finally, many of you are aware of the revisions made to the Dept. of Ecology's Western Washington Stormwater Manual and the recent discussions by a number of local, state and federal agencies on the ever-changing world of stormwater. WSDOT has revised the WSDOT Instructional Letter regarding stormwater treatment and design considerations and has made it available to the general public. *It is important to note that discussions with the Services are on-going and all aspects of the guidance have not been fully approved by either of the Services.*

Here is a link to WSDOT's revised stormwater information:

<http://www.wsdot.wa.gov/TA/Operations/Environmental/Stormwater4.html> ▲



EPA Estimates Costs of Clean Water TMDL Program

*Reprint from NACE UPDATE,
August 24, 2001 — Volume 01
Number 18*

Implementing one of the key tools under the Clean Water Act for cleaning up the nation's waters, called the Total Maximum Daily Load (TMDL) program, could cost between \$900 million and \$4.3 billion dollars annually, based on a draft cost study released by the U.S. Environmental Protection Agency (EPA) and on which public comment is being requested.

The study complements a report issued on June 19 by the National Academy of Sciences (NAS) recommending changes to the TMDL program. One key finding of the NAS report was that many states lack sufficient data to develop TMDLs for all of their impaired waters. The EPA cost study estimates the costs to states of additional data gathering to support the TMDL program at \$17 million per year. Once states have collected good data, they will need to spend up to \$69 million annually over the next 15 years to develop plans to clean up some 20,000 impaired waters currently on state lists, according to the cost study.

State costs to develop a cleanup plan for each of these 20,000 waters are projected to average about \$52,000 per plan. EPA provides grants to states, tribes and interstate agencies to implement provisions of the Clean Water Act. In the current year, up to \$210 million is available to states for TMDL and related clean water work, including monitoring.

***State costs to develop
a cleanup plan for
each of these 20,000
waters are projected
to average about
\$52,000 per plan.***

Finally, the study projects implementation costs (i.e., costs of installing measures to reduce pollution) of \$900 million up to \$4.3 billion (an unlikely worst-case scenario) per year. These costs, which would be borne primarily by dischargers, include about 90 percent of the waters currently on state lists. For the remaining waters (such as waters impaired by mining or air deposition), EPA does not have sufficient data to estimate cleanup costs at this time.

Today's draft report gives us important new information to use in determining the most effective course in restoring America's waters," said EPA Administrator Christie Whitman. "We will continue to work with all parties to find a better way to finish the important job of cleaning up our great rivers, lakes and streams."

EPA also notes that the high-end estimate of more than \$4 billion to fully implement the cleanup is a fraction of current national expenditures for clean water.

TMDLs are pollution limits set for a waterway, depending on its use. The limits are used to allocate any needed controls among all of the pollutant sources, both point sources (industrial and municipal dischargers) and non-point sources (agriculture and urban runoff).

EPA issued a national rule in July 2000 to revise the existing TMDL program. This rule was scheduled to go into effect in October 2001, but has been the subject of considerable debate, as well as a number of lawsuits. EPA Administrator Christie Whitman announced on July 16 that she is convening a consensus-building process to engage the full spectrum of affected parties in developing a successful TMDL program. The consensus-building process will consider new information, including the recommendations in the recent NAS Report, in an effort to speed up the cleanup of the nation's impaired waters by developing a workable program with broad stakeholder support. To ensure full consideration of new information in an expeditious time frame, she proposed to delay the effective date of the July 2000 rule for 18 months. A formal proposal to delay the rule will be published in the Federal Register for comment next week.

"Our review will help improve our existing TMDL program and will not interfere with ongoing activities, such as development of water quality standards, issuance of permits to control discharges or enforcement against violators,"

said Whitman. "States will continue to identify impaired waters and develop plans for cleaning them up under the current TMDL program, and EPA will continue to support states in that effort."

EPA expects that more TMDLs will be developed during 2001 than in any prior year in the history of the TMDL program. Many states are beginning to find more efficient approaches for developing TMDLs, including bundling plans for different pollutants in the same water body, or for all water bodies within the same watershed, into a single TMDL. The cost study projects increasing efficiencies as states gain additional experience in TMDL development.

The report was requested in congressional appropriations language last fall. EPA is taking public comment for 120 days on the draft report. A copy of the report and additional information is available at: <http://www.epa.gov/owow/tmdl>.



To ALL Local Agency Guidelines (LAG) Manual Users ...

By Darlene Sharar, former Standards and Procedures Engineer, WSDOT H&LP

For those of you who work with the LAG manual, or have co-workers that do ... this message is for you!

WSDOT now has a LAG training site for current and proposed training! This is your resource for LAG training — when, where and how to sign-up. The sites are:

Current LAG and other training:

<http://www.wsdot.wa.gov/TA/Operations/LAG/Lagtrain.HTM>

Future LAG Training:

<http://www.wsdot.wa.gov/TA/Operations/LAG/LAGprotrain.HTM>

There is a list-serve available also! This is used to send out LAG, GSPs and Amendments and other updates that impact your federal programs. It is not the type of list-serve where you get questions sent out all the time ... rather, it is an electronic, instant information resource. Many of you get a hard copy update of the LAG ... using the list-serve will allow you to receive the update before the hard copy is mailed! And, if there is an interim update (between hard copies and CD updates) that you need ... you will get it immediately electronically.

If you are interested in registering, go to:

<http://www.wsdot.wa.gov/TA/Operations/LAG/LAGHP.HTM>

and select the list-serve. You can register here. You may also contact us at (360) 705-7380 and we will be happy to register you!

Any time you have questions, concerns or comments, please let us know!

For more information,
you can e-mail us at
SchofiL@wsdot.wa.gov. ▲



Yankee Ingenuity at Pacific Northwest Transportation Technology

WSDOT and Local Agencies Share Ideas that Reduce Injuries,



(Top) They made it possible. (left to right, Clay Wilcox, (Co-Chair) WSDOT Olympic Region; David Berkman, ADDCO; Jenna Foster, WSU; Marty Weed, WSDOT Olympic Region; Sam Ringwood, Lincoln Co.; Kelly Newell (front), WSU; Dan Sunde (Co-Chair), WSDOT WST2 Center; Loretta Wilcox, Volunteer; Al Holman, Mgr., Grant Co. Fairgrounds; Cathy Nicholas (front), FHWA, Olympia; Sandy Nanney (front), Volunteer; Keith Walker (back), WSDOT North Central Region; Lon Ostensen, Clark Co.; Casey McGill, WSDOT Olympic Region; Ron Nanney, WSDOT Southwest Region

(Right) A very attentive audience at one of the demonstrations.



its Best

Expo 2001

Cost and Time



(Top) A new pothole patching material goes into place.

(Right) A portable traffic message and camera trailer.

*By Dan Sunde, Director
WST2 Center, WSDOT*

Over 700 transportation personnel from around the Pacific Northwest gathered at the Grant County Fairgrounds in Moses Lake on September 12th and 13th to share their innovative “home grown” ideas and see demonstrations of new technology entering the commercial market. Sponsored by the Washington State Department of Transportation (WSDOT),



Washington State Technology Transfer (WST2) Center and Federal Highway Administration (FHWA), the second Pacific Northwest Transportation Technology Expo allowed state and local agency transportation crews to share inventions they created to improve safety, reduce cost and increase efficiency, and see some of the latest, leading edge technology in their field. Ideas and new technologies were shared in all aspects of public sector transportation including design, construction, maintenance and operations. Practical applications resulting from recent research were also shared along with new high-tech equipment developed by FHWA.

Transportation personnel often invent productive tools that get a heavy workout in their own shops or offices, but other shops and agencies don't often get an



The Asphalt Zipper, a big hit at the Expo, is run through its paces.



A wide variety of commercial indoor exhibits were available.



Exhibits ranged from computer software to heavy equipment.



There was something for everyone. A group gets to play with some cold mix ACP.



The Asphalt Zipper drew a big crowd of attendees.



New technology in commercial equipment was on display and demonstrated.



Paul Harker and Cal Frobig represented FHWA and Western Federal Lands.

opportunity to hear about them or get their hands on the information necessary to build them themselves. The Expo helps solve this problem by encouraging crews to see firsthand what other shops have developed. It provides them with the opportunity to talk to the inventors and try out the inventions so they can take the ideas back to their own shops. A WSDOT Transportation Technician stated, "I thought I was only coming to show our invention, but I'm going back with six ideas to add to our own shop."

The Better Mousetraps carried the event this year with over 70 of these homegrown inventions displayed and demonstrated. Many of the crews presented display boards and handouts with information to help their counterparts understand how their "Mousetrap" works and how they can build their own. This year, participation expanded with over twice as many Washington local agencies



There were over twice as many Mousetraps for the 2001 Expo as last year.



A hydraulic excavator system prepares to go to work.



(Top Left) Live demonstrations allowed attendees to evaluate the new technology firsthand.

(Top Right) Successful public agency initiatives and processes such as GEM, the Southwest Inter-agency Co-op, also exhibited.

(Middle) Laurel Gray, WST2 Training Coordinator, provided a wealth of free technical information and was ready to respond to your requests for information or training.

(Bottom) Several WSDOT offices offered up-to-date information on the implementation of new technologies and the services they provide.



bringing their equipment as well as a contingent of Oregon DOT and Oregon county personnel bringing theirs.

Overall, the inventions ranged from simple custom hand tools to sophisticated high-tech computer systems. WSDOT Olympic Region brought their "Road Warrior," a custom designed, self contained traffic control and emergency response truck, which has proven itself invaluable on I-5. The City of Renton brought a waste diesel recycling system that saves the city thousands of dollars in diesel purchases and hazardous waste





*The
"Better Mousetrap"
is awarded each quarter
for the most innovative
working ideas presented
by a public agency and
published in WST2*

Award:

The best concepts will be published in the WST2 and posted on the WST2 Web Page.

Published mousetraps will receive a "Better Mousetrap" baseball cap and certificate.

Published mousetraps will be included in competition for the annual "Crystal Mouse" award.

Eligibility:

Washington State Public Agencies.

Mail To:

"Better Mousetrap"
WST2 Center/WSDOT
P.O. Box 47390
Olympia, WA 98504-7390

E-mail:

WST2Center@wsdot.wa.gov

For questions:

Dan Sunde, Director of Technology Transfer
SundeD@wsdot.wa.gov
(360) 705-7390

"Better Mousetrap" Submittal Form

Name of the "Better Mousetrap":

Submitter's Name:

Title:

Agency:

E-mail Address:

Address:

City:

State:

Zip+4

Phone Number : ()

Developer's Name(s):

Title:

Agency:

E-mail Address:

Address:

City:

State:

Zip+4

Phone Number : ()

Description of the "Better Mousetrap"

Why was it necessary?

How does it work?

How was it built? (Include Sketches, Photos, Drawings)

How does it perform?

**Please add a sketch with dimensions and materials used!
We will draw plans from them so others can build it too!**



*To select the **2001 Crystal Mouse Award** winners, attendees voted for one entry in each of the two categories: Best Tool and Best Equipment/Equipment Modification.*

Watch for the Next Issue of WST2 To See who are the Winners!

disposal fees. All were developed with the idea of doing things smarter, safer, more efficiently and less expensively.

Besides the mousetraps, attendees watched new equipment run through its paces. A big hit was the Asphalt Zipper, a new grinding machine that mounts to a front-end loader. The Zipper grinds a path in the asphalt pavement of a roadway to allow access to utilities in just a few minutes, saving hours of backbreaking work for

road crews. New pothole patching materials, equipment and techniques were demonstrated along with the latest in de-icing and anti-icing chemicals.

The Federal Highway Administration (FHWA) demonstrated two high-tech pieces of automated data collection equipment that have recently evolved out of research: the Road Surface Analyzer (ROSAN), that collects information on roadway surface texture and ride quality; and the

Retroreflectometer, equipment that collects sign reflectivity data to determine the condition of highway signs. Both pieces of equipment collect their data at highway speeds.

Plan to attend next year and bring your agency's inventions with you. If an idea works for you, others can benefit. Through the exchange of ideas new solutions will be developed, existing inventions will be improved and we will all get a bigger bang for our buck! ▲



(Top) People from state, county, city and tribal transportation departments observed demonstrations and picked up ideas to improve their own operations from others "mousetraps." (Bottom Left) Jerry Lowery, clasping his hands, and Jon Moergen, right arm raised, from Washington State DOT in Tacoma explained how their debris pusher, fastened to the front of a dump truck, captures debris from the Interstate at highway speeds. (Bottom Right) WSDOT Southwest Region's custom designed platform truck reaches for the sky. Bridge and overpass repairs are much easier to make using this scissor platform!



(Top Left) Bob Neal, Grant County, WA, with his "Neal" wheel.

(Top Right) Ken Schave, WSDOT Southwest Region, explains how the Restrictor Rod designed by Marvin Cox works.

(Bottom) Over 700 attended this year's event. There were plenty of exhibits to view.





(Top) There were over 150 exhibits and demonstrations presented each day.
 (Middle) Brian Ziegler, WSDOT's State Maintenance and Operations Engineer, discusses the Road Warrior with co-designer Sue Mackey, WSDOT Olympic Region.

(Bottom Left and Bottom Right) WSDOT South Central Region's Truck Mounted Sweeper Cage drew a lot of attention. Here, developer Paul Ahmann points to the frame, made from an old snowplow. The Sweeper Cage was made from used parts from an old sweeper. It uses the truck's hydraulic system.





(Top Left) WSDOT Aberdeen brought examples of the "pigs" used to clean culverts. They are pulled through by an excavator.
 (Top Right) Forrest Brumfield demonstrates WSDOT SW Region's portable sign washer powered by a pickup battery.
 (Lower Left) WSDOT's Aberdeen shop devised a sign holder that mounts in the trailer hitch receiver for mobile operations.
 (Bottom Right) Jimmye Crawford explains how his break-away sander-spinner slips aside when bumped — then springs back and locks in place.



(Top Left) WSDOT's Port Orchard shop's herbicide spreader can carry 400 pounds and covers areas adjacent to highways at 7 to 10 m.p.h., saving time over hand-spreading.

(Top Right) Skip Simpson, WSDOT Eastern Region, Davenport shop, explains their Eye Level Stick to some interested observers.

(Middle) Charlie Jensen, WSDOT North Central Region, Twisp shop, demonstrates how his Plow Bit Changer raises a bit the right height for bolting. The weight on the handle slides to balance the unit.

(Bottom) A wide variety of "home grown" inventions were brought by local agencies across Washington State and Oregon.

(Top Right) Jeff Brodhead and Peggy Dennis, WSDOT South Central Region, Walla Walla, show how their Paint Trailer carries templates, paint of several colors, and a hose sprayer for marking pavement and covering graffiti.

(Top Left) A portable self-contained pressurized glass beader is demonstrated by WSDOT Olympic Region's Pete Peterson and a co-worker.

(Bottom Left) Reflectorized beads are shot under pressure deeply into the paint, improving quality and endurance while cutting quantity.



(Above) Galvanized steel piling collar designed by Rick Hazen of WSDOT Southwest Region cinches up as bolts are tightened to hold new piling section spliced onto older section.



(Top Left) The Expo allowed crews to talk directly with the inventors.

(Top Right) Close-up of WSDOT Olympic Region Port Orchard shop's Herbicide Spreader.

(Middle Left) WSDOT's Port Orchard crew members Richard Sands, Tim Van Berkomp, and Chris Christiansen show how their trailer hauls everything needed to repair guardrail in compartments and racks Chris fabricated.

(Middle Right) Tim Van Berkomp and Aaron Corliss, WSDOT Port Orchard, built adjustable "boots" to facilitate asphalt patching.

(Bottom) The left "boot" in the locked "up" position.





(Top) FHWA's Retroreflectivity testing equipment collects sign reflectivity data as it passes by.

(Bottom) FHWA's Road Surface Analyzer (ROSAN) gathers roadway information on surface texture and ride quality.

(Top) Jerry Lowery, WSDOT Olympic Region, Tacoma, explains the finer points of his Debris Pusher to interested Yakima county workers Ed Hall and Matt Pietrusiewicz

(Middle) Jerry Lowery and Jon Moergen (kneeling), WSDOT Tacoma Maintenance Shop, share a thought.

(Bottom) WSDOT Olympic Region Aberdeen shop designed and built a sturdy Chip Spreader Hitch that bolts to the rear of a dump truck. The spreader box latches on to the round bar. It can remain on the truck.





(Top Left) Crowds continued to be impressed with the WSDOT South Central Region Connell Delineater Punch, last year's Crystal Mouse Award winner.

(Top Right) Jody Osterhout and Terry Mitchell from Benton County Public Works Department check out the guard-rail debris remover built by Jack Moltz and Daryl Sprague of WSDOT Southwest Region, Chehalis.

(Middle Left) Heated Screed built by Don Bailey (retired) of Multnomah County, Oregon, pushes hot mix over grinder patches and wheel ruts, and can be adjusted by the operator inside the cab.

(Middle Right) WSDOT Northwest Region, Bellingham, brought their Sliding Rock Plow.

(Bottom) Chip spreader hitch mounted on a dump truck.



*(Top and Middle Left)
"Look Ma! No Driver!"
JJ Johnson, WSDOT North
Central Region (second
from left), instructs an
attendee on how to operate
the region's remote con-
trolled front-end loader.
(Middle Right) JJ impresses
a crowd with a demonstra-
tion of the remote-controlled
front-end loader.
(Bottom) Home of the
Pacific Northwest
Transportation Technology
Expo.*



Photos by: Dan Sunde and Wendy Schmidt

MUTCD Millennium Edition State Adoption Process Underway



*By David Sorensen – Traffic
Technology Engineer*

The first MUTCD Millennium Edition adoption meeting was held Monday October 22, 2001 at the WSDOT Traffic Office in Olympia. The technical review committee

for this process represents FHWA, WSDOT Traffic Office, WSDOT Highways and Local Programs, Cities, Counties, transportation consultants, and the State Attorney Generals Office. The Office of Superintendent of Public Instruction will also be involved.

Review committee chair Mike Dornfeld of the WSDOT Traffic Office anticipates a June 2002 completion date for the committee's work. State Traffic Engineer Toby Rickman will then make the final decision based on the proposed recommendations from the technical review committee.

In late January 2002, WSDOT will host a series of statewide meetings to solicit input from Local Agencies, tribes, and ports. Forums will be held in Yakima January 23, Spokane January 24, Seattle area January 30, and Vancouver, WA on January 31. If you would like to participate in this process by providing input at these forums, or for more information on dates, times and locations please contact Laurel Gray at (360) 705-7355, or Wendy Schmidt at (360) 705-7386.

For more information on the adoption process itself please contact Mike Dornfeld at (360) 705-7288. ▲

AWC Technology Grant Program

*By Jim Seitz, Transportation
Specialist, AWC*

Association of Washington Cities (AWC) has awarded technology grants totaling approximately \$200,000 to 52 cities. Another \$25,000 in grant funds will also be spent to fund unanticipated hardware and installation costs for these cities. A total of 147 cities applied for this new grant program. The average grant amount was \$4,000. The majority of the funding will go toward computers, monitors, fax machines, networking, dedicated phone lines, email and Internet access.

AWC and AWC Insurance Services offered this Technology Grant Program to its members for the

first time this year. The purpose of the new program was to fund municipal projects that:

- Help cities communicate more effectively and easily with their citizens and AWC;
- Help improve communication technology amongst employees within cities;
- Fill the unmet communication technology needs of cities;
- Would not otherwise be implemented due to limited fiscal capacity.

The program was created to give cities the immediate ability to com-

municate and share information throughout all levels of the city, within the community and with AWC. The immediate goal was to give all cities access to a computer and resources like appropriate software and hardware, fax machine, email, Internet access, technical support and training.

Many of the cities awarded grants require installation help and technical assistance, and AWC's contracted information services staff will help these municipalities with setup and basic instruction on operating systems.

For more information, contact Jim Seitz, Transportation Specialist, Association of Washington Cities (AWC), (360) 753-4137. ▲

MUTCD

The New Millennium Edition

Reprint Courtesy of the Arizona LTAP Center newsletter, "Milepost"

The Manual of Uniform Traffic Control Devices is published by the Federal Highway Administration and is incorporated by reference under 23 Code of Federal Regulations, Part 655, Subpart F. Therefore, all changes to the MUTCD must go through the federal rulemaking process.

The MUTCD is comprised of 10 parts. The following is a summary of what is in each part.

Part 1 — General Provisions

The term "road users" replaces the word "motorists." Topic headings identify the following provisions — standard, guidance, option, support. A new "Definitions" section was added.



Part 2 — Guide Signs

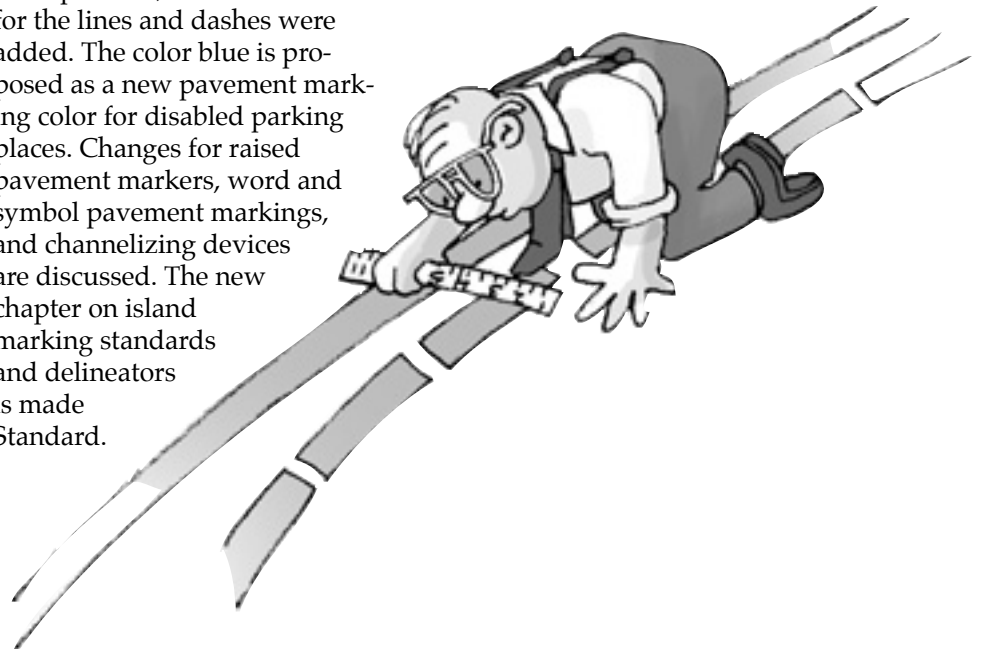
Designates "Special Purpose Roads" and terminology changes. For example, "Changeable Message Signs" will replace "Variable Message Signs." All signs are to be retroflectorized or illuminated with minimum retroreflectivity levels. New tables identify standard sign colors and their use. New sections clarify sign lettering use and mounting height. Day and night inspections are proposed as part of routine sign maintenance.

Part 3 — Markings

Basic patterns, widths and uses for the lines and dashes were added. The color blue is proposed as a new pavement marking color for disabled parking places. Changes for raised pavement markers, word and symbol pavement markings, and channelizing devices are discussed. The new chapter on island marking standards and delineators is made Standard.

Part 4 — Signals

Changes include expanded definitions, recommendations for less restrictive measures for signal installation, changes in the application of steady signal indications and a recommendation to replace the yellow flashing indication with two new lane-use control signals. Many of the proposed updates to Part 4 respond to the needs of an aging population of drivers and visually impaired pedestrians.



Part 5 — Traffic Control Devices for Low Volume Rural Roads (New)

This section replaces Traffic Islands, which will be included in Part 3. Part 5 defines three categories of low-volume roads: unimproved roadways, graded drained earth or gravel roadways and paved roadways. It also provides options for placing traffic control devices on roads with limited shoulders. A new “NO TRAFFIC SIGNS” sign is proposed for roads with no signs.



Part 6 — Temporary Traffic Control

Many changes in Part 6 relate to recommendations contained in the Older Driver Highway Design Handbook. “Common sense” standards were added to cover inapplicable signs. Crews are advised to remove work zone warning signs once the work is completed and not to post signs before work begins.



Part 7 — Traffic Control In School Areas

A new typical school route plan is proposed that includes middle and high schools. Engineering studies are recommended for School Crosswalk. Warning signs and the use of high-visibility material is recommended for crossing guard uniforms.

Part 8 — Traffic Control At Highway-Rail Grade Crossings

The discussion on roadway-rail intersection closures and construction and maintenance operations was expanded. The addition of retroflective white material to the railroad crossbuck signs is proposed to improve visibility. Other proposed changes include 16 new definitions and new sections on dynamic envelope delineation, storage space signs, private crossings, crossing identification sign placement, high-speed trains, no signal signs and four quadrant gates.

Part 9 — Traffic Control For Bicycle Facilities

Proposed revisions were added for “shared use paths.” New text indicates that a solid white line is not the only method to separate shared use paths from the travel way. Additional word and symbol messages were added for shared use and preferential bicycle lanes. Diamond pavement marking symbols were removed because of potential confusion with HOV lane markings. A requirement that signal timing on bikeways be reviewed and adjusted for the visibility needs of bicyclists was proposed.

Part 10 — Traffic Control For Light-Rail Transits (New)

A series of new signs is proposed to mitigate potential conflicts between pedestrians and vehicles with Light Rail Transit. It includes lane use restrictions, divided highways with rail crossings and a new optional warning sign at signalized intersections near grade crossings. The FHWA also proposes the use of standard traffic control signals (typical red, yellow, green ball and/or arrow) to control light rail transit movements.



MUTCD — Frequently Asked Questions

Reprint Courtesy of the Arizona LTAP Center newsletter, "Milepost"

Part 1

Q Does the MUTCD apply to all roads and streets in the United States?

A Yes. As provided in Title 23 of the Code of Federal Regulations. Part 655.603 states that the MUTCD is the national standard for all traffic control devices installed in any street, highway, or bicycle trail open to public travel.

Q Are State and local agencies required to use metric units?

A No. States and local agencies are not required to use metric units. The MUTCD contains both English and metric units so that those who choose to use metric measurements will have them available.

Q Who is responsible for selection, installation, and maintenance of traffic control devices?

A State and local highway agencies are responsible for selection, installation, and maintenance of traffic control devices.

Q Is there a streamlined process for experimental devices approved in one State to be used in another State?

A There are times when several State or local highway agencies are interested in experimenting with the same new traffic control device or application. The FHWA headquarters office must receive a request to experiment from each interested jurisdiction responsible for installing the experimental traffic control device or application. To help expedite the preparation of the experimentation request, FHWA headquarters can provide the State or local highway agency with a copy of previously approved experimentations. To help expedite the review process, the State or local highway agency can check with the Division Office to see if the experimentation request may be submitted directly to FHWA headquarters with a courtesy copy to the Division Office.

Q On existing streets/private streets, how do localities retrofit to meet standards?

A Each local jurisdiction should dedicate time to properly assess traffic control operations and needs to budget funds required for implementing MUTCD changes and to make the changes either through new project installations or through routine maintenance and replacement schedules.

Q On private property open to public travel, whose responsibility is it to ensure compliance with the MUTCD?

A The responsibility to ensure compliance with the MUTCD rests with the local jurisdiction that owns and operates the roadway open to public travel.

Q How strict are compliance dates? What is the penalty for not having an acceptable plan in place by compliance dates?

A Compliance dates are given to provisions in the MUTCD that are mandatory conditions. This means that the FHWA has determined that a particular provision is required and it is important for improving the effectiveness and enhancing the safety of the traveling public. One of the penalties for noncompliance on Federal-aid projects is that funds may be withdrawn. Now that states no longer have sovereign immunity, legal suits are another possible penalty for noncompliance especially in situations where an accident occurred and may be attributed to inadequate or inappropriate traffic control devices.

Q Is there a provision for sign colors?

A Yes. Section 1A.12 assigns colors and appropriate application. Blue is used for signs that guide road users to general services, specific services, or tourist-oriented destinations. Brown is used for signs that guide road users to recreational and cultural interest areas. Green is for other guide signs that direct road users to destinations.

Q What is the difference between "effective" vs. "adoption" date.

A The “effective date” applies to the Federal Register final rule. The changes officially become a part of the National MUTCD after a 30-day period. The “adoption date” applies to Title 23, Code of Federal Regulations, Part 655.603. It gives states 2 years from the effective date to adopt the changes in the National MUTCD. For example: The 2000 MUTCD was published in the December 18, 2000 Federal Register. The effective date of the 2000 MUTCD was January 17, 2001. The adoption date is January 17, 2003.

Part 2

Q How are “Attractions” defined in the new category for specific service signs?

A Attraction services are similar to recreational and cultural interest area signs. Attraction service signs direct motorists to amusement, historical, cultural or leisure activities open to the public. Attraction signs are different from recreational and cultural interest area signs in that they are not used within parks, or on trails, or on structures within recreational and cultural interest facilities.

Q Is there an order of priority for installing signs, especially when spacing is limited?

A Yes. Because regulatory and warning information is more critical to the road user, the order of priority is regulatory signs installed first, then warning signs, then guidance signs.

Part 3

Q What are the new markings for traffic calming?

A Markings for roundabouts, markings for other circular intersections, speed hump markings, and advance speed hump markings are the new markings for traffic calming.

Q Are signs required in conjunction with the YIELD AHEAD markings?

A Yes. Section 3B.19 Pavement Word and Symbol Markings: “A yield ahead triangle symbol or YIELD AHEAD word pavement markings may be used on approaches to intersections where the approaching traffic will encounter a YIELD sign at the intersection.”



Part 4

Q Are there any new devices for persons with disabilities?

A Yes, there are new devices in the Manual. They can be found in Part 4, Section 4E.06, “Accessible Pedestrian Signals,” and Section 4E.08, “Accessible Pedestrian Signal Detectors.”

Q What accommodations have been made for older drivers in Part 4?

A A new Guidance statement was added to recommend using 300 mm (12 in) signal lenses where there are a significant percentage of elderly drivers. A support paragraph was added on the use of backplates on signal heads to help elderly drivers see the contrast between traffic signals and their surroundings. Guidance text was added recommending that the use of signal visors be considered as an alternative to signal louvers because visors do not diminish light output. An Option was added to use passive pedestrian detection equipment in crosswalks to extend the length of the pedestrian clearance time for that particular cycle when a pedestrian needs more time to cross the street.

Q Does the MUTCD allow changing from a stop-and-go traffic signal operation to a flashing mode during low volume periods?

A Section 4D.11, Application of Flashing Signal Indications, and Section 4D.12, Flashing Operation of Traffic Control Signals, do not provide standards, guidance, or options on the reasoning behind the decision of changing from a stop-and-go operation to a flashing operation. Those sections of the MUTCD discuss flash rate, the flashing indications and the means and conditions pertaining to how flashing mode is initiated and terminated.

Q Are there any standards in the MUTCD for priority control systems, specifically for emergency vehicles?

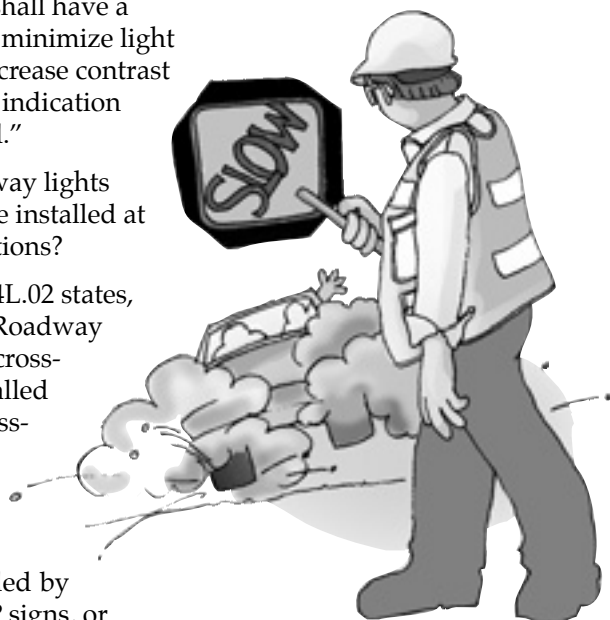
A Section 4D.13 provides standards, guidance and options for the preemption and priority control of traffic control signals. Priority control is typically given to certain non-emergency vehicles such as buses and light-rail vehicles. Preemption control is typically given to emergency vehicles.

Q Does the MUTCD give a recommendation on the color of traffic signal heads?

A Yes. In terms of the housing of the signal, in Section 4D.18, the MUTCD states, "To obtain the best possible contrast with the visual background, signal housings should be high-way yellow." The MUTCD also provides standards as follows, "The inside of signal visors (hoods), the entire surface of louvers and fins, and the front surface of backplates shall have a dull black finish to minimize light reflection and to increase contrast between the signal indication and its background."

Q Are in-roadway lights allowed to be installed at signalized intersections?

A No, Section 4L.02 states, "If used, In-Roadway Warning Lights at crosswalks shall be installed only at marked crosswalks with applicable warning signs. They shall not be used at crosswalks controlled by YIELD signs, STOP signs, or traffic control signals."



Part 5

Q How does Part 5 relate to other sections of the MUTCD?

A Part 5 contains criteria for low volume roads and supplements other parts of the MUTCD.

Q In Part 5, the W20-7a Flagger sign is different from the one shown in Part 6. Which sign is correct?

A The sign in Part 6 is the correct sign. There was an error in Part 5, and FHWA will change Part 5 to agree with Part 6 by an NPA later this year.

Q What is the maximum volume on a road to be considered a low volume road?

A The maximum volume for a low volume road is 400 ADT. See section 5A.01.

Part 6

Q Are there any new typical applications?

A Yes, there are two new applications. They are Figure TA-45, temporary reversible lane using movable barriers, and Figure TA-46, work in vicinity of highway-rail grade crossing, to provide additional information concerning work zone treatments near highway-rail grade crossing.

Q Are non-black on orange pedestrian warning signs permitted in work zones?

A Yes. In Section 6F.02, General Characteristics of Signs, FHWA added an option statement which reads "In order to maintain the systematic use of yellow or fluorescent yellow-green background for pedestrians, bicycle, and school warning signs in a jurisdiction, the yellow or fluorescent yellow-green background for pedestrian, bicycle, and warning signs may be used in temporary traffic control zones." This statement was added to include the fluorescent yellow-green color because many jurisdictions have adopted this optional warning sign color for pedestrian, bicyclist, and school facilities and locations. In addition, this provides more flexibility to State and local highway agencies to increase awareness of pedestrians and bicyclists in temporary traffic control zones.

Q Are there any guidelines for what abbreviations to use when creating or editing Portable Changeable Message Signs?

A When abbreviations are used, they should be easily understood and the abbreviations are located in Section 1A-14, Abbreviations Used on Traffic Control Devices.

Part 7

Q Have there been any changes in the MUTCD regarding the use of STOP paddles for crossing personnel?

A Yes. It provides guidance that calls for the STOP paddle to be a minimum of 18" or larger. In addition, the word "STOP" is now required to be on both sides of the paddle.

Q Does the New MUTCD address a standard for the "Maximum" distance a school crossing can be located from a school? Moreover, if so, what is the limit?

A The MUTCD states in Chapter 7B.08 "If used, the School Advance Warning sign shall be installed not less than 45 m (150 ft) nor more than 210 m (700 ft) in advance of the school grounds or school crossings (see Figure 7B-1).

Q Is crossing guard the same as flagger?

A Chapter 7E Crossing Supervision deals specifically with crossing guard issues. Even though some of the text discussion such as paddle size and the retro reflective clothing issue may be similar to those of a "flagger", flagger issues are covered separately and in more detail in Chapter 6E.

Part 8

Q What are the 16 new items that are defined in this part?

A Eleven of the 16 new definitions deal with preemption of traffic signals at or near highway-rail grade crossings. The other terms are related to items covered elsewhere in Part 8 such as dynamic envelope delineation, cantilevered signal structures and pre-signals.

Q Why did the FHWA decide to change from a guidance condition to a standard condition for the W10-2, W10-3, and W10-4 highway-rail advance warning signs, and does it realize how much of a burden this will put on State and local agencies?

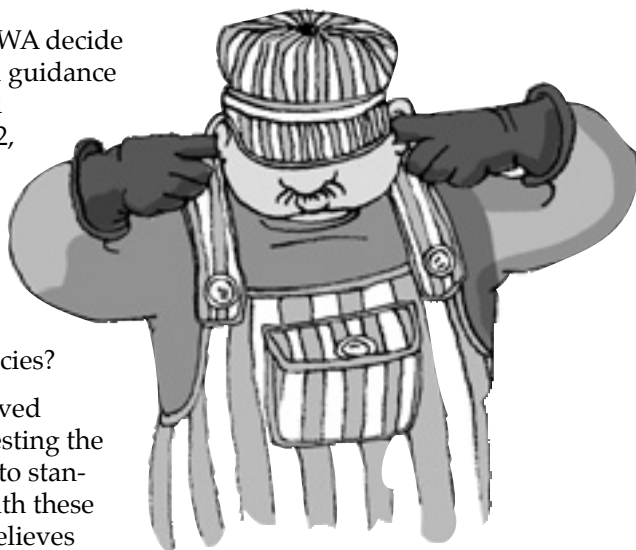
A The FHWA received comments suggesting the change from guidance to standard. FHWA agreed with these comments because it believes motorists on parallel roads should have the same warning as motorists approaching a crossing on a perpendicular road. However, the FHWA understands the level of effort needed to meet this requirement and intends to increase the compliance period for this requirement.

Q Is the retroreflective strip also required for use on the highway-rail advance warning sign?

A No, a retroreflective strip is not required on highway-rail advance warning signs.

Q Does Part 8 include signs for quiet zones?

A Yes, Section 8B.11, NO TRAIN HORN Sign (W10-9), states, "Standard: A NO TRAIN HORN (W10-9) sign shall be installed at each highway-rail grade crossing where there is a Federal Railroad Administration authorization for trains to not sound a horn. The sign shall be mounted as a supplemental plaque below the Advance Warning (W10-1) sign."



Part 9

Q Why was the text requiring a bicyclist to dismount and walk with pedestrians while crossing the street deleted from the new manual?

A FHWA believes that this is a situation where state law or the Uniform Vehicle Code may not require bicyclist to dismount and that it would not be appropriate for FHWA to offer conflicting guidance.

Q What new traffic control devices have been approved for bike facilities?

A In addition to the optional use of fluorescent yellow green for bicycle warning signs, the FHWA adopted 2 new optional signs to aid bicyclists - the R3-16a and R3-17a, which alert the bicyclist that bike lane is ending or that the bicyclist may encounter a parked vehicle ahead.

Q Is parking allowed in bike-way lanes?

A Yes, Section 9B.04 discusses the use of a new optional sign R3-17a as discussed in an earlier question.



Part 10

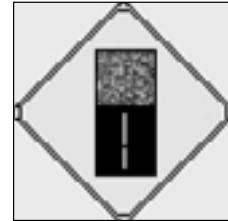
Q Why was the text on traffic signal preemption turning restrictions changed from option in the notice of proposed amendment to a standard in the final rule? And is there a compliance period for this change?

A FHWA decided to change the text on traffic signal preemption turning restrictions from option to standard for the same reason as adding the blank-out turn prohibition sign. FHWA wants to protect motorists by prohibiting vehicles from turning onto the tracks when trains are approaching or occupying the crossing during preemption.

Focus MUTCD

Examples of Changes in the MUTCD

OLD



NEW



MUTCD Compliance Dates

Below is a list of compliance dates for your information.

Please consult the Federal Register for detailed information regarding the sections you are interested in.

Section 2B.04 — STOP Sign. Compliance period of 3 years — January 17, 2004

Section 2B.16 — Reduced Speed ahead Sign. Compliance period of 7 years — January 17, 2008

Section 2B.32 — ONE WAY Sign. Compliance period of 7 years — January 17, 2008

Section 2B.49 — High Occupancy Vehicle Lanes. Compliance period of 6 years — January 17, 2007

Section 2B.50 — High Occupancy Vehicle Sign Applications and Placement.

Compliance period of 6 years — January 17, 2007

Section 2C.02 — Application of Warning Signs. Compliance period of 7 years — January 17, 2008

Section 2C.24 — Shoulder Signs. Compliance period of 10 years — January 17, 2011

Section 2C.37 — Crossing Signs. Compliance period of 10 years — January 17, 2011

Section 2D.38 — Letter Size of Street Name Signs. Compliance period of 15 years from

January 9, 1997 January 9, 2012

Section 2E.29 — Interchange Exit Numbering. Compliance period of 7 years — January 17, 2008

Section 2E.31 — Advance Guide Signs. Compliance period of 7 years — January 17, 2008

Section 2F.05 — Size of Lettering. Compliance period of 10 years — January 17, 2011

Section 3B.01 — Yellow Centerline and Left Edge Line Pavement Markings and Warrants.

Compliance Date — January 3, 2003

Section 3B.07 — Warrants for Use of Edge Lines. Compliance Date — January 3, 2003

Section 4E.06 — Accessible Pedestrian Signals. Compliance period of 4 years — January 17, 2005

Section 4E.08 — Accessible Pedestrian Signal Detectors. Compliance period of 4 years —

January 17, 2005

Section 8B.02 — Highway-Rail Grade Crossing (Crossbuck) Sign. Compliance period of 10 years

— January 17, 2011

Section 9B.04 — Bicycle Lane Signs. Compliance period of 5 years — January 17, 2006

Section 9B.15 — Bicycle Crossing Warning Signs. Compliance period of 7 years —

January 17, 2008

Section 9 — Deletion of Preferential Lane Symbol (Diamond) for Bicycles and Pavement Markings.

Compliance period of 6 years — January 17, 2007

Section 10 — Automatic Gates, Flashing-Light Signals, and Blank-Out Signs.

Compliance period of 5 years — January 17, 2006

Section 10C.11 — Highway-Rail Advance Warning Signs: Removal of existing W10-6 Series Signs.

Compliance period of 5 years — January 17, 2006



PCCP Intersections Design and Construction in Washington State

By Jeff Uhlmeier, Pavement Design Engineer, WSDOT Materials Laboratory

In 1994, Washington State Department of Transportation (WSDOT) began replacing selected asphalt concrete pavement (ACP) intersections with Portland Cement Concrete Pavement (PCCP). These flexible pavement intersections were severely rutted and distressed due to a combination of heavy wheel loads from slow moving vehicles and warm temperatures. The use of PCCP at these locations was considered to be an excellent solution over the design life of the reconstruction. Although WSDOT has considerable experience with cement concrete pavements on its highways, replacement of existing ACP at busy intersections on urban arterials was new and presented a unique challenge. As of September 2001, the Department will have reconstructed seventeen intersections around the state using PCCP with successful results.

Both PCCP and ACP have 40-year design lives; however, PCCP requires very minimal, if any, future rehabilitation. The construction user costs and disruption to traffic that are necessary with ACP intersections during an ACP design life are reduced or eliminated when PCCP is used. The major disadvantage with PCCP intersections is the higher initial construction cost. However, a life cycle cost analysis of PCCP reconstruction versus ACP reconstruction and future ACP inlay repairs shows that PCCP intersection construction competes with and can be less expensive than rebuilding with ACP.

Several municipalities in the State of Washington, including the Cities of Kennewick, Seattle, and Spokane, and Spokane County have successfully completed PCCP intersection projects. The PCCP intersection projects for the City of Kennewick, City of Spokane and Spokane County were selected primarily to eliminate chronic rutting problems. PCCP intersections within the City of Seattle were a result of its PCCP construction program on many of its arterials.

Why PCCP Reconstructed Pavements Now?

One reason for not considering PCCP reconstruction prior to 1994 was related to constructability and concerns about accommodating high traffic flows through urban intersections. Rehabilitating urban intersections with ACP requires rotomilling and inlaying with ACP to remove wheel rutting. This work can typically be done at night, in a short period and with minor inconvenience to the public. On the other hand, rehabilitating intersections with PCCP usually involves disruption of the intersection, including complete closure of the intersection or alternating lane closures. The concern within WSDOT was that the inconvenience to the users was too great to construct urban intersections with PCCP. However, since 1994, WSDOT has shown that PCCP intersections are constructible and the early concerns of traffic interruption have been overcome. WSDOT has built PCCP intersections with the average daily traffic approaching 37,000 on the major leg of the intersection.

Construction Costs

A comparison of initial PCCP intersection reconstruction costs ranged from \$455,500 to \$982,200 for PCCP and \$349,800 to \$728,600 for ACP. The spread in the PCCP or ACP reconstruction costs resulted primarily from the size and variability in unit bid prices for each intersection. Typically, intersection sizes ranged from 4,100 to 6,700 square yards. With the smaller intersections, the unit bid costs typically increased, which also drove up the costs for reconstruction. On the average, initial construction costs for full depth PCCP reconstruction at urban intersections were 25 to 30 percent more than full depth ACP reconstruction.

The cost per square yard for initial PCCP construction costs ranged from \$66 to \$148 per square yard, whereas ACP intersection costs ranged from \$51 to \$109 per square yard. The PCCP reconstruction costs were less when intersections were reconstructed as part of a larger asphalt resurfacing project

Life Cycle Cost Analysis

The 40-year annualized costs for intersections show that full depth portland cement concrete intersection reconstruction is typically less than full depth asphalt concrete reconstruction when future AC inlays are accounted for. A study of six intersections reconstructed with concrete showed that the 40-year annualized cost of five of the six intersections was 6 to 14 percent less than if ACP reconstruction were used.

The 40-year annualized cost for reconstructed portland cement concrete pavement intersections compared to repairing existing ACP intersections using asphalt concrete

inlays at four-, six- and eight-year cycles show the ACP inlay repairs will always be less than the PCCP reconstruction and ACP reconstruction. However, the state or local agency must decide whether ACP inlays meet the expectations of the public. The public view of an agency rehabilitating the same section of roadway at four-, six- or eight-year cycles does not reflect well on the agency.

Traffic Control and Staging

Traffic control and construction staging is a primary issue associated with the construction of PCCP intersections. While some delay to the traveling public is unavoidable, the delay has proven to be tolerable even with limited or complete closures. An important design element is to obtain input from any party that will be affected by the intersection reconstruction. These parties include but are not limited to local governments, fire and police agencies, business owners and private citizens. An important element to contract administration has been the wide publicity by WSDOT Public Information to local governments, businesses and the media, including newspapers and radio.

The Customer Focus Highway Construction Workshop, held in Seattle in January 1999, noted that the traveling public is a lot more tolerant during construction when people are kept informed. With widespread publicity, WSDOT has noticed decreased traffic volumes during intersection reconstructions. The reduction represents people who have found alternative routes or have adjusted their schedules to avoid the construction project.

Staging options for PCCP intersection construction includes the following:

- complete closures with detours
- partial closures with detours
- construction under traffic
- complete closures during limited time period
- combinations of the above.

WSDOT has used complete closures, partial closures with detours, construction under traffic and a combination of construction under traffic and complete closures.

The ideal construction situation is to completely close the roadway. Complete closures allow the contractor to remove and replace more roadway in a continuous and safe operation. Interaction with traffic is avoided and complicated work zone lane configurations are eliminated. However, complete closures also restrict access to businesses that are adjacent to the intersection and are therefore unpopular. Closing a major urban arterial is often not an option, particularly when detours are not available.

The South Central Region used complete closures on SR 395 in Kennewick, where the Clearwater Avenue, West Kennewick Avenue, and Yelm Street intersections were reconstructed. One intersection per weekend was reconstructed during September and October 2000. The contract specified closing each intersection at 7:00 p.m. Thursday evening and opening to traffic by 6:00 a.m. the next Monday morning. Local traffic was detoured to adjacent streets, while state highway traffic was detoured over nearby Interstate Highways.

Before the weekend closures, the South Central Region reconstructed the approach and leave legs of the intersections under traffic. During the weekend closures, the contractor removed and replaced the roadway within the intersection square (radius return to radius return) and a portion of each approach or leave legs of the adjoining city streets. PCCP placement and curing proceeded well, with the roadway opening well ahead of the 6:00 a.m. Monday morning target. For all three closures, the roadway was opened to traffic by 6:00 p.m. Sunday.

Following the closures, WSDOT received very favorable comments from both businesses and residents. Full documentation of the Kennewick area accelerated reconstructions, including a video and construction report, will be available through the Innovative Pavement Research Foundation.

Design and Construction Considerations

Common design elements for PCCP intersections include:

- construction limits
- jointing details
- pavement profile
- concrete materials
- construction time
- special provisions, and
- traffic detection systems

Common construction concerns include:

- concrete placing techniques
- construction sequence
- placement of in-place fixtures such as utility boxouts, and storm drains

Design and construction considerations, including:

- PCCP intersection construction costs
- life cycle costs
- traffic management, and
- quality control issues

are detailed in a report dated May 2001, Report No. WA-RD 503.1, "PCCP Intersections — Design and Construction in Washington State."

For more information or to obtain a copy of the intersection report, contact Jeff Uhlmeier, WSDOT Pavement Design Engineer, WSDOT Materials Laboratory, PO Box 47365, Olympia, WA 98504-7365, Phone: (360) 709-5485, Email: uhlmej@wsdot.wa.gov ▲

Bill Jantz'

Snow Plow Stands and Lifting Lever

By Wendy Schmidt, Assistant Editor, WST2

Anyone who drives a snowplow or works in a local agency road maintenance shop and has to remove and remount the plow, possibly numerous times during the winter, knows what a job it is. When snowplows were unhooked from a truck in the WSDOT's Northwest Region, they were set on the ground and blocked up using wooden blocks. Plows with steel bits were stored resting on the steel bit with the hitches blocked up using signpost scraps and shims. Plows with rubber bits were blocked both in the rear at the hitches and in front at the plow supports just behind the blade to keep the rubber bit off the ground to protect them.

The drawback to the "old way" of doing things was that the plows were front-heavy and easily tipped forward or knocked off their supports. Because of the instability it wouldn't take much of a bump to cause a plow to tip or the hitch to fall to the ground. Then in autumn or early winter, with storms threatening, it's time to put the plow back on! What a job to get everything lined up! There had to be a better way!

Bill Jantz, Maintenance Technician II at the Washington State Department of Transportation Northwest Region Everett Maintenance Shop, came up with a combination of steel stands that he welded onto the

back side of the snowplow blade and at strategic points on the hitch to support the whole unit when it is disconnected from a truck for storage. He welded two stand assemblies to the blade, one on each end of the blade about a foot from the outside edge. They were angled forward to place the support in front of the center-of-gravity for stability. Then he welded two more to the hitch "V" supports, one on each side.

The stands themselves are quite simple: Bill used 2.5" x 2.5" square tubing for a sleeve, into which slides a 2" x 2" square tube with a plate "foot" welded on the end that acts as a stand. He drilled half-inch diameter holes through both the sleeve and the 2" x 2" tube stand and inserted a 3 1/2 or 4-inch pin with a cotter key to hold the stand in place. To stow the stands during use of the snowplow, another set of holes were drilled through the 2" x 2" tube about ten inches lower. This allowed the stand to be stowed up and out of the way by sliding it up through the sleeve and holding it in place with the pin when the plow is in use. When it is time to remove the plow from the truck, the pins are pulled, the 2" x 2" stands are slid down through the sleeves to the supporting position, and the pins are re-inserted. To make sure that the pins don't stray from where they are needed, Bill connected each pin to its sleeve by welding an 8-inch long chain between the head

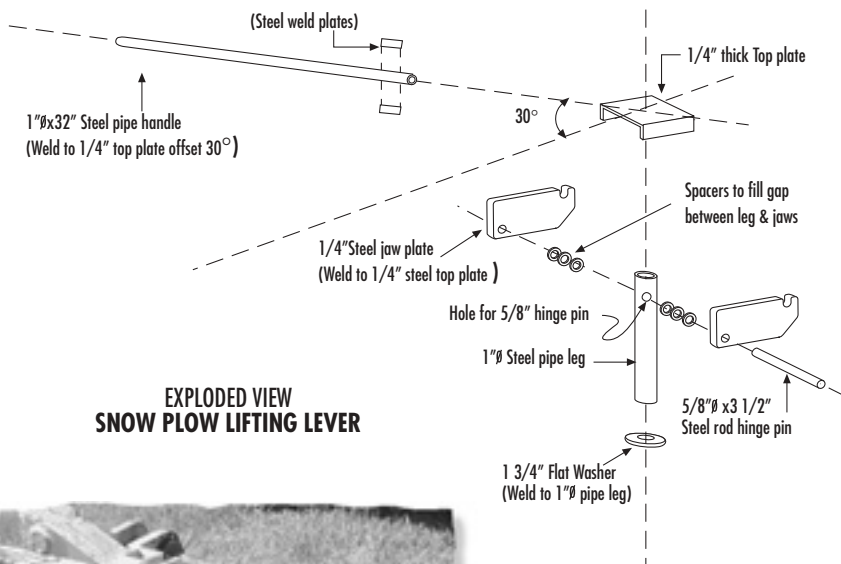


of the pin and the sleeve. When the tube sections in all four of the stands are extended, the entire plow and hitch unit rests stably and securely with the bit just off the ground.

Bill also made a lifting bar-jack that permits easy, one-handed lifting of the plow's hitch when it is time to hitch it up to the truck. It works on a simple lever/fulcrum principle. It hooks under a rod welded horizontally onto the most easily accessible side of the sleeve of the stands on the hitch. When the handle is pushed down, the jaw plate raises the hitch for easy adjustment and fastening. It detaches and the action is repeated on the other side.

Bill reports that crewmembers are very pleased with the performance of the lifting bar/jack and the plow stands, too.

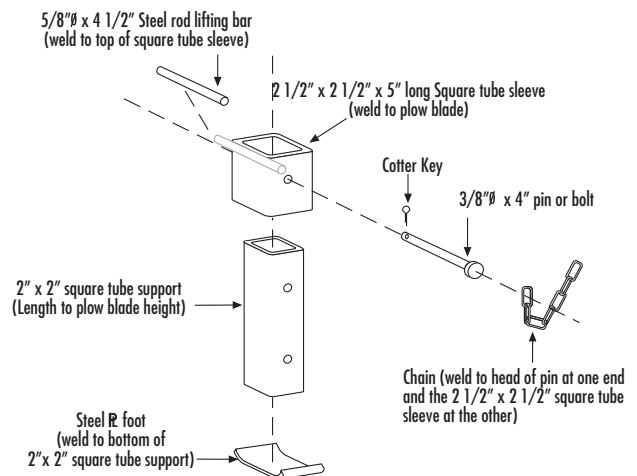
For more information you can contact the WSDOT Everett Maintenance Office by telephone at (425) 339-1780, and ask for Bill Jantz. ▲



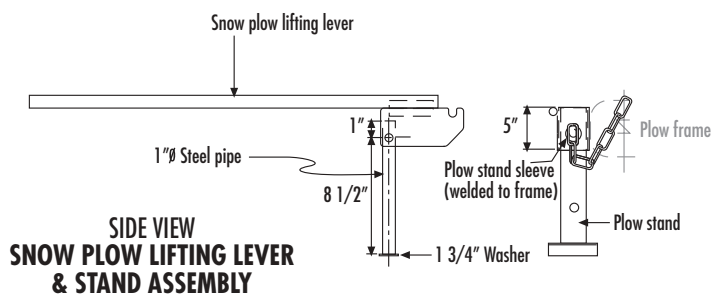
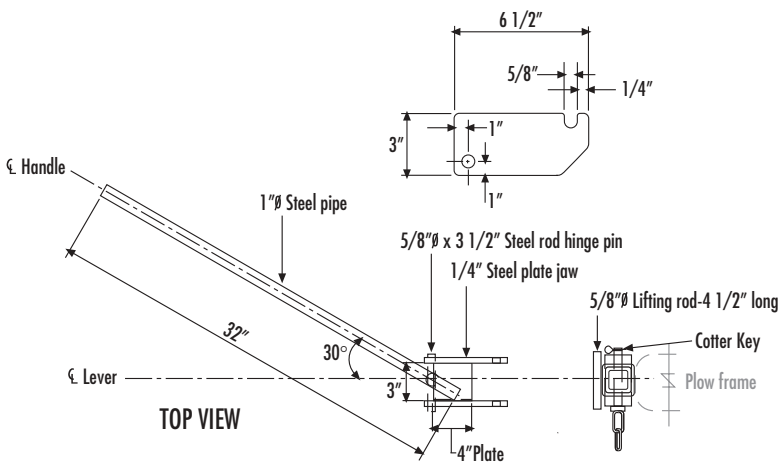
EXPLODED VIEW SNOW PLOW LIFTING LEVER



The bar jack handle is welded at an angle to avoid the truck's bumper.



EXPLODED VIEW SNOW PLOW SUPPORT ASSEMBLY



SIDE VIEW SNOW PLOW LIFTING LEVER & STAND ASSEMBLY



This snowplow jack is angled for balance.

Jerry Lowery's Debris Pusher

*Co-Authors: Jerry L. Lowery,
Olympic Region Maintenance,
and Jack Manicke, Staff
Maintenance Superintendent,
WSDOT Maintenance Office*

Debris in roadway lanes is a major hazard to the traveling public. It can cause accidents and injuries as vehicles veer around or hit it, thus adding more congestion to already overcrowded highways. Removal of debris from roadways comes with exposure to traffic. This greatly degrades the safety of highway maintenance workers doing the removal. It also has an economic impact on the public through traffic delays and stoppages. As always, highway maintenance crews are looking for better and safer ways to keep traffic moving. These issues led to the development of the "Debris Pusher."

With this tool, one maintenance technician and truck can safely remove debris from a roadway at speeds consistent with traffic. This is achieved by approaching the debris at speed, then lowering the "Debris Pusher" to capture the material. The debris can be moved across multiple lanes, if necessary, to reach a safe place where it can be picked up and removed.

With on going use the "Debris Pusher" has shown itself to be a valuable tool for other maintenance projects. Here are just some of the jobs made safer and more efficient with its use: Sweeping operations, ditch cleaning, tree removal and brushing, and lastly cleaning catch basins and grates under hazardous

conditions. It has allowed these jobs to be completed quickly using less equipment and personnel.

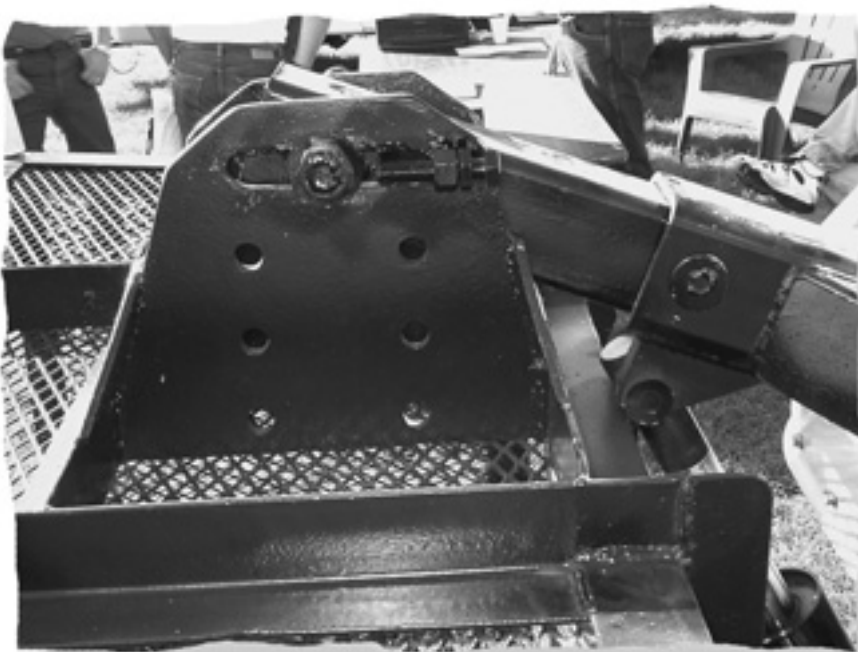
The "Debris Pusher" has shown itself to enhance employee safety, maintain traffic flow and reduce costs to maintenance organizations and construction companies. This

truck attachment is simple, durable and an inexpensive piece of equipment with multiple uses in any highway program.

For more information or any questions or comments, please contact Jerry L. Lowery, WSDOT Tacoma, (253) 983-7550. ▲



Jerry Lowery (left) thought up the Debris Pusher, and constructed it with Jon Moergen, fabricator (right).

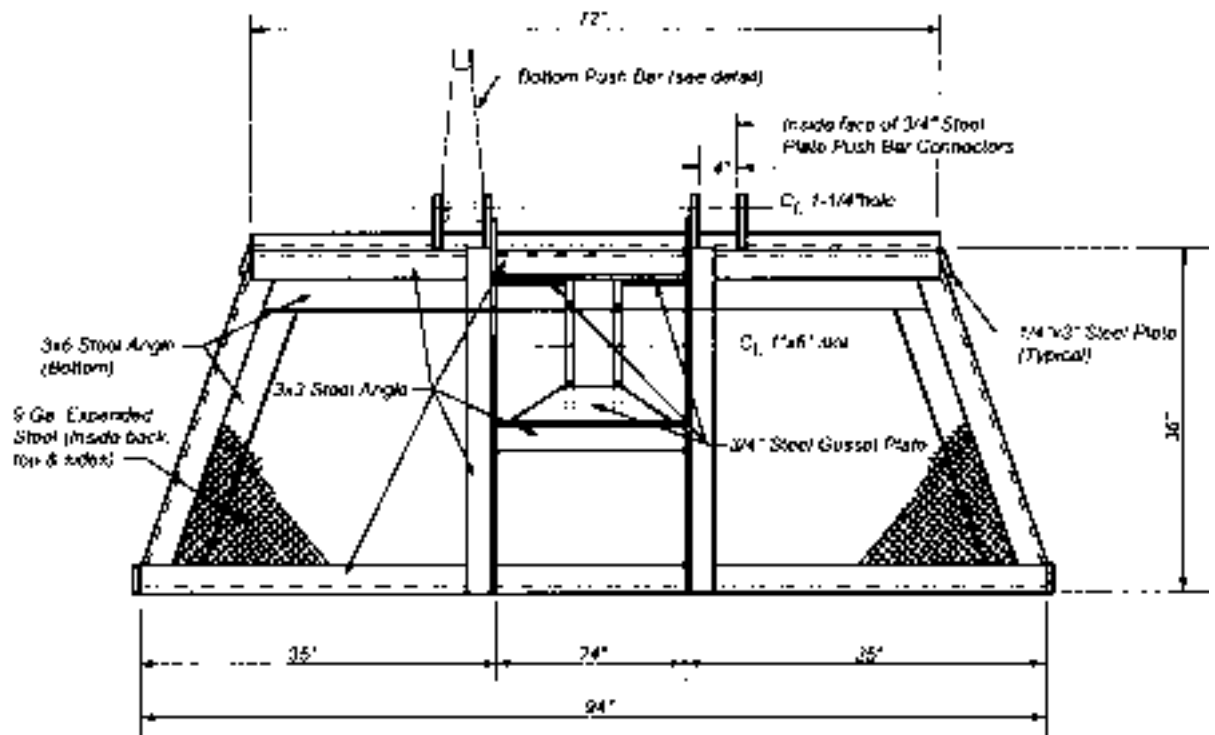


(Top Left) The Debris Pusher can scoop up debris laying in the travel lanes or on inside shoulders along barriers while traveling at highway speed. The driver captures the debris, then moves right, as traffic allows, to the outside shoulder, where the contents can be deposited and safely picked up.

*(Top Right) Close up of broom bristles.
(Lower Left) Close up of top assembly.
(Bottom) Side and front views.*

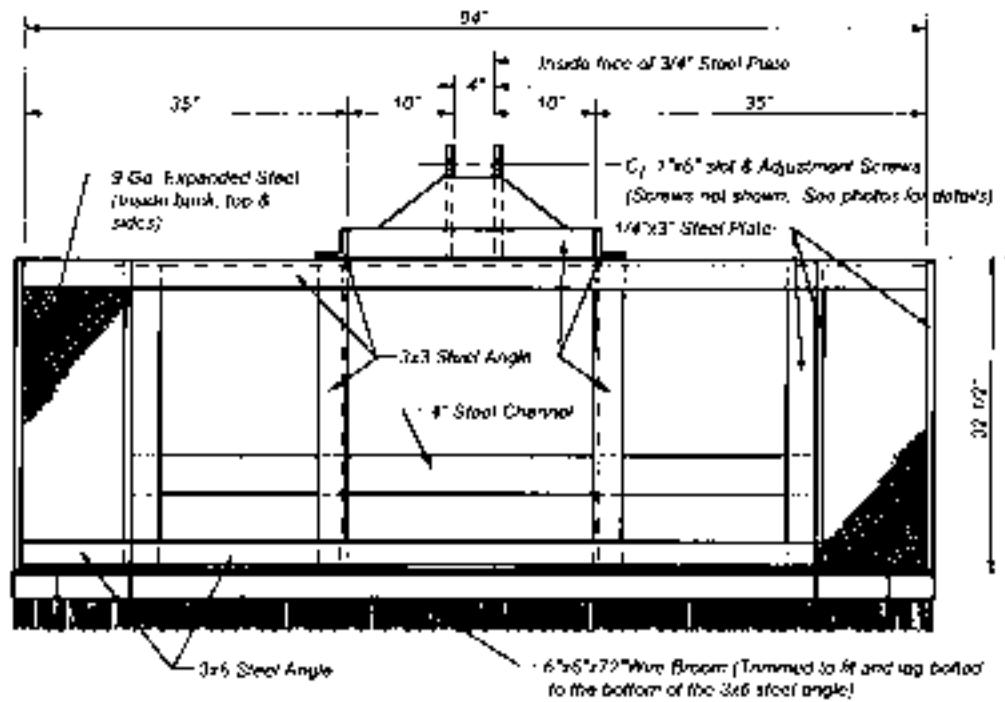
Photos by: Mike Evans and Dan Sunde



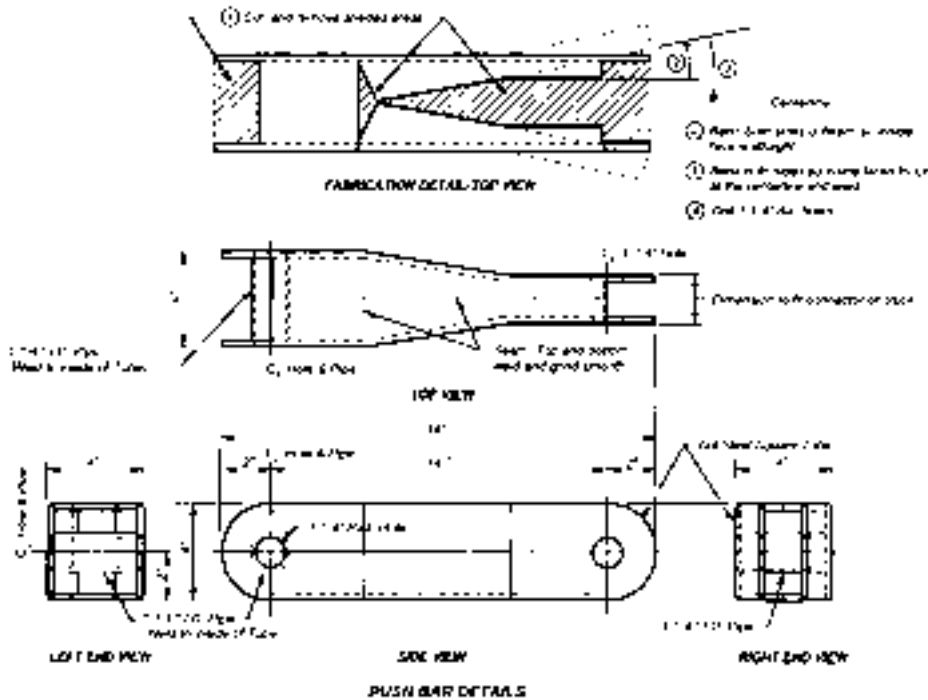


TOP VIEW

Note: Adjustment Screws not shown. (See photos for details.)
Dimensions are in inches.



FRONT VIEW



Debris Pusher

Parts List

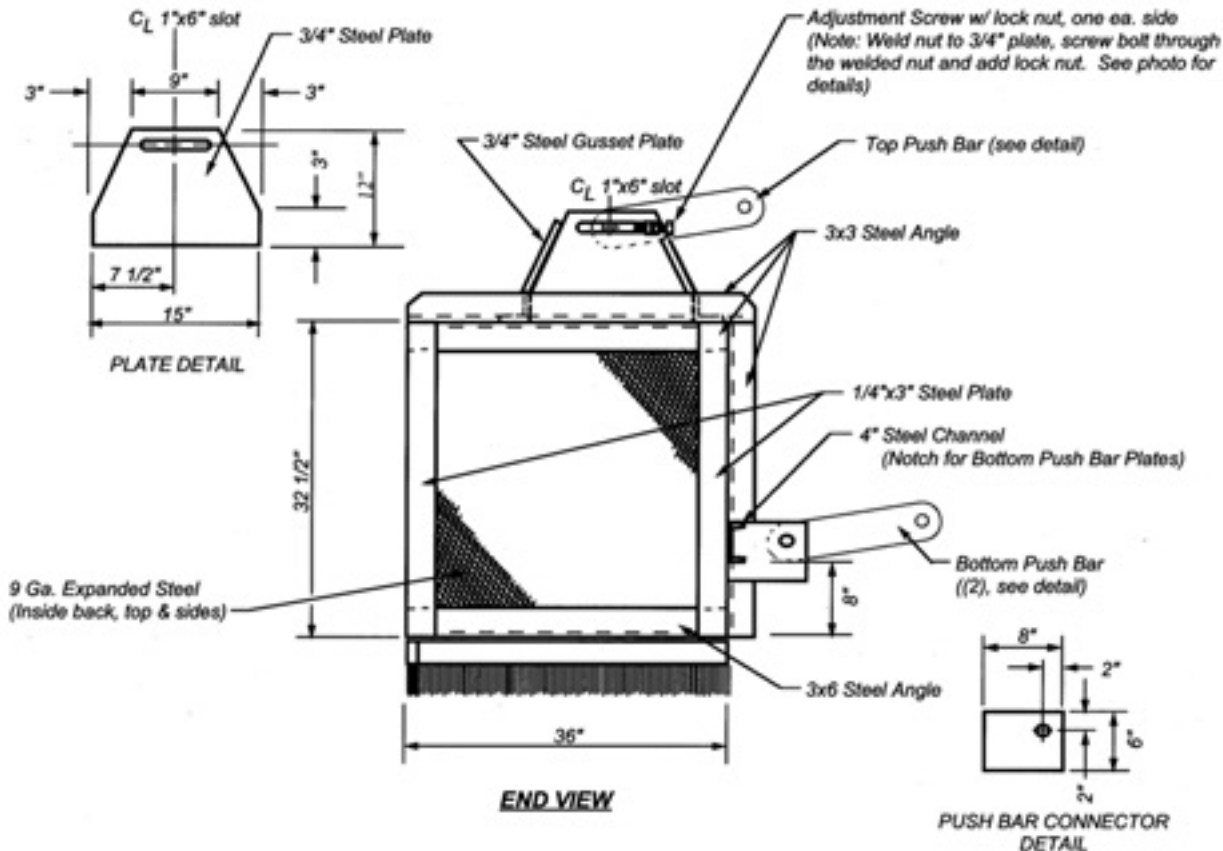
Pin	1 1/4" x 6"	4 ea.
Pin	3/4" x 6"	1 ea.
Bolt	3/4" x 4"	2 ea.
Lag bolt	3/16" x 1 1/2"	36 ea.
Nut	3/4"	2 ea.
Allthread	1" x 8"	1 ea.
Nut	1"	2 ea.
Safety pin	3/16"	6 ea.
Flatwasher	1 1/4"	8 ea.
Flatwasher	1"	4 ea.
Welding rod	1/8" rock mount AAA Polaris	10 lbs.
Primer	Zinc	1 gal.
Enamel	Equipment	1 gal.
Thinner		1 gal.
Traffic wand	2" x 24" yellow	2 ea.
Wire broom	6" x 6" x 72"	2 ea.

Wire broom manufacturer: United Rotary Broom, Kansas
Part Number: 45-0406W 6' broom, 45-0407W 7' broom

Materials List

Angle iron	3" x 3"	38 Linear ft.
Angle iron	3" x 6"	12 Linear ft.
Flat steel	1/4" x 3"	18 Linear ft.
Channel iron	4"	6 Linear ft.
Flat steel	1/2" x 12"	3 Linear ft.
Square steel	4" x 4"	8 Linear ft.
Expanded steel	9 gauge	60 Sq. ft.

Dimensions are in inches.



WSDOT Seeks Local Agency Partners In Pedestrian Research Project

By David Sorensen, WST2 Traffic Technology Engineer, and Julie Mercer Matlick, Community Partnership Program, Highway & Local Programs-WSDOT

Highways and Local Programs-WSDOT is seeking volunteer local agencies that have in-pavement flashing crosswalk lights and/or pedestrian half signals to participate in a project to evaluate these new traffic devices.

WSDOT is forming a partnership with local agencies and a research team from a regional university, with the university team conducting the data analysis. The project will:

- Investigate and summarize the current state-of-the-art of pedestrian facility improvements for roadways;
- Perform studies on the effectiveness of selected pedestrian facilities;
- Work with a Technical Advisory Committee formed by WSDOT to develop specific recommendations for the selection and implementation of pedestrian facility improvements.

Transportation agencies, municipalities and other governmental agencies across the state of Washington are placing increasing emphasis on the design of transportation facilities to allow the safe and easy movement of pedestrians. As part of this emphasis, a number

This study will evaluate possible enhancements or changes to these treatments that could provide additional safety benefits and recommended changes where appropriate.

of relatively new pedestrian treatments have been developed and implemented in the last few years. This study will evaluate possible enhancements or changes to these treatments that could provide additional safety benefits and recommended changes where appropriate. For example, should the yellow In-Roadway Warning Lights at crosswalks be red instead of yellow as is currently in use?

Unfortunately, there is little information available on the relative merits of these new treatments. There is a lack of data available on specific, common, pedestrian benefits or the conditions under which each pedestrian improvement should be employed.

This project will involve several different efforts. First it will provide a summary of what has been learned by the rest of the country.

It will analyze the effects of specific pedestrian treatments in Washington (just in case Washington conditions lead to different results from elsewhere in the country) and develop a document that can be used by state and local governments to select and design pedestrian improvements under their jurisdiction.

The purpose of the analysis is to provide a better understanding of these devices and their effectiveness. The goal of the analysis is to determine if the selected pedestrian improvements actually have a long-term impact on the number and severity of accidents at a location. If there are benefits, are there specific conditions that must be present for those treatments to provide benefits or are there specific conditions that limit those benefits?

For additional information or if your agency would like to participate and/or add data to this project, please contact:

David Sorensen, Traffic Technology Engineer, 360 705-7385, SorensD@wsdot.wa.gov

or

Julie Mercer Matlick, Community Partnership Program, 360 705- 7505, MatlicJ@wsdot.wa.gov ▲

Safety and Aesthetics In Urban Roadway Design: An Innovative New Approach

By David Sorensen, Traffic Technology Engineer, WSDOT H&LP, and Nancy Boyd, Project Manager, Safety and Aesthetics in Roadway Design, WSDOT Design Office - Safety Research Unit

Washington State's population is growing at a rate that is placing ever-increasing demands upon our transportation system. Urban roadways, in particular, are suffering from significant additional functional burden. Engineers and planners from state, federal, and local agencies are challenged by the need to reconcile multiple, sometimes conflicting, expectations for urban roadways.

Much of the apparent conflict involves balancing regional and local safety needs and requirements with the desire for aesthetic design features. Many of these features are considered fixed objects, as defined in the AASHTO Roadside Design Guide, and are often located within the design clear zone. Decisions are further complicated by a variety of related issues. These include:

- Access management
- Urban median design
- Context-Sensitive Design
- Utility pole location
- Bike and Pedestrian access and safety
- Transit service

"The project mission supports the evaluation and development of design standards and policies..."

- Trees, landscaping, and other aesthetic improvements
- Capacity demand
- Traffic calming
- Process issues including the route development plan approval process and project development schedules

A piecemeal, or hands-off approach to addressing these issues encourages divisiveness and contributes little toward achieving the ultimate goal of a safe, aesthetically pleasing design. It is imperative that this array of issues is examined carefully, rationally, and comprehensively in the development of design policies for urban roadways.

WSDOT's Design Policy, Standards, and Safety Research Unit is charged with leadership responsibilities for coordinating and conducting safety-related research and analysis to support the evaluation, development, implementation and communication of design standards, policies and performance measures.

In June 2001, following an evaluation of existing efforts, the unit initiated a new project, "Safety and Aesthetics in Urban Roadway Design", in response to the compelling need for consideration of the broader array of issues related to design standards and research.

The project mission supports the evaluation and development of design standards and policies, and takes a comprehensive look at safety and aesthetic issues in urban roadway design from operational and jurisdictional viewpoints. WSDOT will work with local agencies to determine guidelines and policies that provide functional, safe, and aesthetic transportation facilities that meet local and state needs.

An interdisciplinary team with representatives from the Office of Trade and Economic Development (OTED), Association of Washington Cities (AWC), WSDOT, County Road Administration Board (CRAB), County Engineers, FHWA, and Federal Transit Authority (FTA) will identify priorities, issues and work elements. Once a work plan is organized, the group will set up a production team focused on completing the specific work plan tasks.

For additional information related to Safety and Aesthetics in Urban Roadway Design, please contact Nancy Boyd, Project Manager, at 360-705-7255, Email: boydn@wsdot.wa.gov. ▲

Safe Winter Driving

In the Washington Cascade Mountains

By Jack Manicke, Staff
Maintenance Superintendent,
WSDOT, and WST2 Advisory
Committee Member

Winter driving on highways in the snow-capped Cascades can be a pleasant adventure or it can be a frustrating, tiring and sometimes hazardous experience. The Washington State Department of Transportation provides the following information to help make your winter and mountain driving safe and pleasant.

Winterizing your vehicle

- Before heading for snow country, make sure your brakes, windshield wipers, defroster, heater and exhaust system are in top condition.
- Check your antifreeze and be ready for colder temperatures. You may want to add special wiper fluid to your windshield washer reservoir to prevent icing.
- Check your tires. Make sure they are properly inflated and the tread is in good condition.
- Always carry chains. Make sure they are the proper size for your tires and are in working order. You might also want to take along a flashlight and chain repair links.



*...good idea to take
along warm blankets
and extra clothes.*

- Other suggested items to carry in your vehicle are an ice scraper, a broom to brush snow off, a shovel to free your car if it's "snowed in" and sand or burlap for traction if your wheels should become mired in snow.
- It is also a good idea to take along warm blankets and extra clothes. A lengthy delay will make you glad you have them.

Driving Tips

- Allow enough time. Trips to the mountains can take longer during winter than other times of the year, especially if you encounter storm conditions or icy roads. Get an early start and allow plenty of time to reach your destination.
- Keep your gas tank full. You may be caught in a traffic delay or road closure. It may be necessary to change routes or even turn back during a bad storm.

- Keep the windshield and windows clear. You may want to stop at a safe turnout to use an ice scraper or broom. Use the vehicle defroster and a clean cloth to keep the windows free of fog.
- Slow down. Highway speeds of 55-70 miles per hour may be safe in dry weather, but they are an invitation for trouble on snow or ice. Snow and ice make stopping distances much longer, so keep your seat belt buckled and leave more distance between your vehicle and the vehicle ahead. Bridges and shady spots can be icy when other areas are not. Remember to avoid sudden stops and quick turns.
- Be more observant. Visibility is often limited in winter by weather conditions. Slow down and watch for other vehicles and for snow removal equipment. Snow removal vehicles have flashing amber lights, but visibility may be so restricted during storms that it will be difficult to see the slow moving equipment.
- When stalled, stay with your vehicle and try to conserve fuel while maintaining warmth. Be alert to any possible exhaust or carbon monoxide problems.

Chain Up Regulations

- You must stop and put on chains when highway signs indicate chains are required. You can be ticketed and fined by the Washington State Patrol if you don't. There will usually be a designated area along the right shoulder to install your chains.
- Chain up regulations can change rapidly from place to place because of changing weather conditions.
- When you must put on chains, wait until you can pull completely off the highway to the right. Do not stop in a traffic lane where you will endanger yourself and block traffic.
- Chain Installers: If you use the services of a chain installer, be sure to get a receipt. Remember, chain installers are independent business people, not Washington State Department of Transportation Employees. Having the receipt and installer business information may help with any misunderstandings later.
- When removing chains, drive beyond the signs reading "End of Chain Up Area" to a wide right shoulder where you can safely pull off to remove them.

About Delays and Closures

- Weather and road conditions change rapidly and may cause a change in the location of chain up areas or a closure of the highway. The highway may be open when you leave home, but may close or have chain up regulations imposed as you are traveling to your destination.
- Spinouts and accidents happen frequently during storms, which may block the highway for several hours. Heavily traveled routes such as Interstate 90 and U.S. 2 are particularly vulnerable to such closures because of their high traffic volumes.
- Avalanche control is another cause for closing a highway as well as zero visibility caused by high winds and blowing snow. This happens frequently on Interstate 90 and U.S. 2 during winter storms.
- Washington State Department of Transportation officials urge you to check road conditions often. This will help keep you knowledgeable of changing conditions. The department maintains a free "Highway Information Line" at 1-800-695-7623. An Internet web page at wsdot.wa.gov/traveler and radio transmitters along the highways at various locations set at 1610 Mz. AM for local highway specific information. These information networks are updated as conditions change. ▲



Washington State
Department of Transportation

Highway Information Line

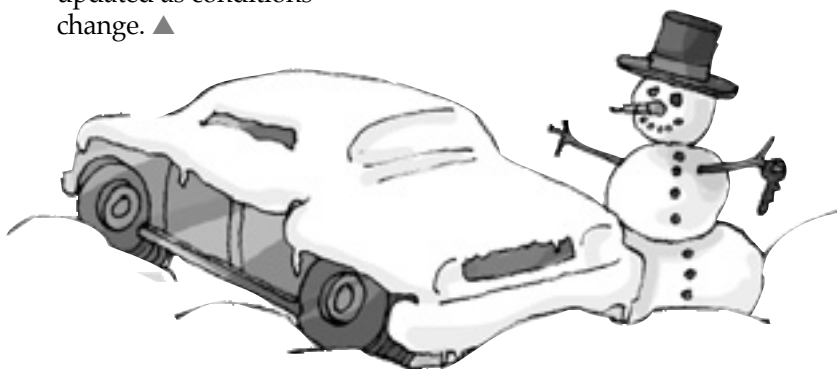
1-800-695-7623

Internet Web Page

www.wsdot.wa.gov/traveler

Radio Information

1610 Mz. AM



Transportation Projects Awarded For Excellent Project Delivery and Community Involvement Efforts

By Kimberly Colburn, Public Information Officer, WSDOT Highways & Local Programs

Six transportation projects received the 2001 Project Excellence Awards. The Project Excellence Awards are a joint effort of the Washington State Department of Transportation Highways & Local Programs and the Federal Highway Administration. The awards are given annually to provide recognition for federally funded projects that exemplify the best in Washington State. These awards will be presented at the fall conferences of the American Public Works Association and Washington State Association of Counties. The following local governments sponsoring the projects were recognized for their excellent project delivery, efficiency and community involvement efforts:

Best City Project: City of Palouse, East Main Street

East Main Street (SR 272) was a total infrastructure improvement project spanning approximately four blocks in the heart of the downtown business district beginning at the intersection of SR 27 and SR 272. The SR 27 portion included complete reconstruction of the roadway in sections and overlay work in others. It also encompassed a major

redesign of the S-curve area of SR 27 that featured a widened travel way, sidewalks, retaining walls, and landscaping. The SR 272 work included total reconstruction of the roadway and asphalt overlay, sidewalks, streetlights, landscaping, signage and street furniture including benches, clock, water fountain, trashcans, and planters. Funding sources included \$1 million in federal funds and \$1.5 million in local funds.

For further project information contact Brent Rasmussen, WSDOT Local Programs Engineer, at (509) 324-6080.

Best City Project: City of Vancouver, Mill Plain Extension

The Mill Plain Extension is a 1.4-mile, four lane extension beginning at Fourth Plain Blvd. (SR 501) in the Port of Vancouver, crossing over the BNSF railroad classification yard, across the southern edge of the Hough Neighborhood, and connecting with the Mill Plain Blvd./15th Street couplet at Columbia Street near downtown Vancouver. This project provides a much-needed link between the I-5 corridor and the Port of Vancouver to accommodate continuing economic growth in and near the Port and increasing recreational

activities in western Vancouver. Funding sources included \$12 million in federal funds and \$23.5 million in local funds.

For further project information contact Bill Pierce, WSDOT Local Programs Engineer, at (360) 905-2215.

Best County Project: King County, Novelty Bridge

The Novelty Bridge Replacement Project replaced the substandard truss span and approaches with a new steel tied-arch bridge and precast concrete girder approach spans. The main span is 295 feet long flanked by two 82-foot approach spans on each side of an overall structure length of 623 feet. This bridge is the first to be assigned a project artist and the first bridge to incorporate artistic elements. The bridge was successfully completed on a very ambitious construction schedule. Total closure time was seven months for removal of the old and construction of the new bridge, to the satisfaction of commuters and the business community. Funding sources included \$7.7 million in federal funds and \$4.5 million in local funds.

For further project information contact Terry Paananen, WSDOT Local Programs Engineer, at (206) 440-4734.



Six transportation projects received the 2001 Project Excellence Awards. The Project Excellence Awards are a joint effort of the Washington State Department of Transportation Highways & Local Programs and the Federal Highway Administration. The awards are given annually to provide recognition for federally funded projects that exemplify the best in Washington State.

Best County Project: Skagit County, Cook Road Improvement

As an alternative to SR 20, Cook Road has become the preferred route providing a more direct connection from I-5 to Sedro-Woolley, and to other destinations east via the North Cascades Highway. Prior to construction, Cook Road was a two-lane rural roadway with little or no shoulder space, clear zone deficiencies, and no turning lanes. Cook Road was reconstructed and widened from Green Road east to SR 20. The project involved removing old concrete panels, widening the roadway and shoulders, adding channelization and illumination, installing curbs, gutters and sidewalks, and improving the drainage system to meet current environmental standards. The project also included the construction of two bridges. The Cook Road Improvement project was a partnership effort between Skagit County and the city of Sedro-Woolley and was managed by Skagit County. Funding sources included \$3.7 million in federal funds and \$6.8 million in local funds.

For further project information contact Terry Paananen at (206) 440-4734.

Best Enhancement Project: City of Oak Harbor, Community Gateway & Pedestrian Respite Area

The chosen site for this project, located where SR 20 enters the city of Oak Harbor, consisted of an abandoned lot and former service station site, which was an eyesore to the city. The city converted the site into a respite area for pedestrians and bicyclists, which included—among other elements—pathways, sidewalks, interpretive signage, illumination, landscaping, parking stalls, and ADA accommodations. Funding sources included \$97,880 in federal funds and \$53,420 in local funds.

For further project information contact Terry Paananen at (206) 440-4734.

Best Special Project: City of Colville, Colville 2000 Phase 1

The Colville 2000 Phase 1 project is a very successful public and private partnership that combines economic development goals with major improvements to regional and local transportation systems. Completion of the Phase 1 Wynne Street arterial improvements resulted in the immediate relief of 3600 average vehicles daily off of U.S. 395, which is also Main Street in Colville. U.S. 395 is designated as a "Transportation Corridor of National Significance" and is a major freight corridor to Canada. Other innovative and beneficial design elements of the project include the use of traffic calming bulbs and medians to slow traffic and improve pedestrian safety. Funding sources included \$3.3 million in federal funds and \$448,000 in local funds.

For further project information contact Brent Rasmussen at (509) 324-6080.

Pictures of the winning projects can be viewed on the Internet at: <http://www.wsdot.wa.gov/TA/PE01/PE01.html>. ▲



News Alerts

*By Jennifer Boteler
WSDOT Librarian*

You can keep up with the latest transportation news without having to subscribe to newspapers, magazines or journals, and it is free. The Internet provides you with the opportunity to have news delivered to your desktop. You don't have to visit several web sites and see what they have posted that day. Instead, you sign up for a news alert service and the headlines, press releases, and late breaking stories are delivered automatically to you through e-mail. News alerts are different from newsletters delivered by e-mail: a typical news alert e-mail consists of a headline or short description of the news item with a link to the full story.

All of the major national network and newspaper sites offer breaking news lists, as do most of the major search engines: ABCNews.com, CNN.com, washingtonpost.com, NYTimes.com, Yahoo!News, etc. I tried several of the search engine news alert services and found Northern Light's to be fairly easy to activate and the results were on point.

Following is an example of how to subscribe to one of these news alert services.

1. Go to Northern Light <http://www.northernlight.com>
2. At top left of screen, click on "Alerts".
3. On the next screen, after "Set up a free Northern Light Search Alert Account," click on "Set up".
4. Fill out the form, then click on "Submit".
5. Next, click on "Create New Alert." Hints: at prompt to "Enter Search Terms Below," choose "Search News" and then choose "Power (search)". This will allow you to limit your search by subject and types of documents to be searched.
6. After completing the form click on "Save Alert" at top of page.

Here is a selective listing of Transportation related News Alerts:

U.S. DOT News by E-Mail

<http://www.dot.gov/affairs/listserve.htm>

U.S. DOT ITS Cooperative Deployment Network

<http://www.nawgits.com/jpo.icdn.html>

National Transportation Safety Board Press Releases

<http://www.nts.gov/Pressrel/pressrel.htm>

AASHTO News

<http://www.transportation.org/aashto/news.nsf/homepage/overview>

Scientific American, Intelligent Information Systems

<http://www.sanewsletters.com/ITS/>

National Academies, National Academy of Engineering

<http://nationalacademies.org/mail.html>

If you need assistance in subscribing to a news alert service, give me a call or drop me a line at the WSDOT Library.

— Jennifer Boteler (360) 705-7751
botelej@wsdot.wa.gov

WSDOT Library Your info link
P.O. Box 47425
Olympia, WA 98504-7425
(360) 705-7750



Words from the Chair

As unaccustomed as I am at writing letters or messages I find it a challenge to convey information this way. I would like to thank those of the NWPMA who attended the 5th International Conference on Pavements in Seattle in August. It was an interesting affair where we heard how agencies from many nations went about business and how they were solving problems. I did find it interesting that many of these problems we have already solved. To me, I felt we were hearing the same topics and problems we have heard before with nothing new we could use. I do feel, however, that all members should attend one of these conferences.

As many of you know, I was elected the new Chair of the Association, and Dusty Cureton of Madison County, Idaho, was elected to the E-board as representative from Idaho. I would like to congratulate Dusty on his election. A full list of the results of the election is available from our "New" Secretary-Treasurer, Vicki Griffiths.

I would highly recommend that all give a vote of thanks to Bill McEntire for his leadership in the past year as Chairman.

The Pavement Manager of the Year went to a very deserving individual, as all will agree, who has done more to promote Pavement Management in Oregon and Idaho than anyone I can think of. He helped me establish my Pavement Management System that has helped Ada County immensely and has allowed us to bring other agencies into the exciting realm of Pavement Management. The person I speak of is Joel Conder. Thank you Joel, for all your help and insight. I look forward to your input on the E-board. I know the organization is better with your help than without it.

I would highly recommend that all give a vote of thanks to Bill McEntire for his leadership in the past year as Chairman. My hope is to equal that leadership for the next year.

George Alton, Chair





Parting Words from the 2000-2001 Chair

Well folks, this will be my last "words". Election of officers was held at the international conference in Seattle. Your chairperson for the remainder of 2001 and the first three-quarters of 2002 is George Alton from Ada County, Idaho. George has been involved with Ada County's pavement management program since 1996. George brings a wealth of experience and knowledge to the NWPMA and is a great choice as the new chairperson.

The International Convention on Managing Pavements is over. I was lucky enough to attend, but I came away with mixed feelings. I learned that, for the most part, we here in the Northwest are on the cutting edge of pavement management techniques. However, Europe and other countries around the world seem to be more comfortable with automated data collection than most of us here. Some countries are using partnerships and toll roads more than here in the Northwest, but the bottom line is we are all trying to receive the greatest benefit with the least amount of capital outlay. It was a great experience to hear perspectives from around the globe.

*...thank you for
all your support.
It has truly been
my pleasure to serve
as the chairperson
for the group this
past year.*

I would like to thank everyone for the wonderful support I have received over the past year. Thanks to your efforts, we have adopted a training matrix that will help serve the organization in the future. Additionally, we are moving forward with a review of the deduct curves for the pavement rating manual. Both of these would not be possible without the support and input from the group.

Your new executive board and chairperson are already working on the Spring quarterly meeting and the Fall 2002 conference. With the training matrix as a guide, the programs that will be put together should be exciting. Dates, places

and programs are yet to be determined. If you would like to have input into this process, now is the time to speak up. As budgets get tighter and tighter, training and travel are the first areas to be cut. Keeping the NWPMA active and vital is but one of the challenges facing the organization in 2002.

Once again, thank you for all your support. It has truly been my pleasure to serve as the chairperson for the group this past year. Good luck to all, and I will see you at the next conference.

Bill McEntire



NovaChip — A Mid-Range Option Worth Considering



*By Bob Brooks,
Pavement Technology Engineer,
WST2 Center, WSDOT*

As pavement managers, you are all aware of the value of preventive maintenance in managing our street networks. One dollar spent for preventive maintenance at the right time can save \$3 to \$10 or more in major rehabilitation or reconstruction costs later. Many tools of varying cost are used for pavement preservation. One widely used tool is seal coating. Seal coats are an effective, low cost treatment for surface rehabilitation but have some limitations and drawbacks in their use. Another commonly used, albeit more expensive, treatment is an asphalt concrete pavement (ACP) overlay. These can be non-structural or structural in nature depending on pavement needs, offer excellent benefits but require considerably more preparation and are fairly expensive.

Mid-range options between seal coating and ACP overlays have been somewhat limited in choice and performance. However, a new (new to Washington state anyway) paving technology pro-

vides another choice to the pavement manager that offers many of the benefits of both an ACP overlay and seal coating. NovaChip, an ultrathin bonded wearing course intended for structurally sound pavements, is a process that has been used since 1988 in France and was introduced to the US market in 1992. While new to Washington State, NovaChip has been applied to over twenty million square yards of pavement in the US since its introduction, with very favorable results reported.

The NovaChip process is a single pass system that utilizes a polymer modified emulsion sprayed on the road surface at a temperature of 175 degrees F, immediately after the emulsion goes down a

gap-graded hot mix is placed over the emulsion membrane and rolled to seat the aggregate. It can be turned over to traffic as soon as the mix cools sufficiently, usually 10 – 20 minutes. This process results in a mat thickness between 3/8 and 3/4 of an inch, depending on the aggregate used.

The paver is specific to the NovaChip process but the hot mix is made in a conventional mix plant. The cost of paving using the NovaChip process averages about \$4.75 per square yard in the Northwest at the present time. This price is expected to drop \$0.75 to \$1.00 per square yard as larger jobs become more common and contractors purchase their own Novapavers.



The NovaChip Paver is a unique paving machine that lays down the bonding coat and the paving mat at the same time.



The final thickness of the NovaChip single-pass process is 3/8 to 3/4 inch.



The demonstration project on Highway 17 in Soap Lake, WA is the first use of NovaChip by the WSDOT.

Surface preparations should include the removal of plastic pavement markings, sealing cracks greater than 1/4 inch wide, filling deformities greater than 1/2 inch deep, protecting manholes and drains, and sweeping.

Some of the performance characteristics that can be expected from the NovaChip process include: excellent bonding to asphalt and

concrete surfaces, light weight, maintains curb and drainage profiles without grinding, no loose aggregate, high skid resistance, reduced tire splashing and hydroplaning, reduced tire noise, fast application with a quick return to traffic – thus greatly reduced user and business delays, reductions in traffic control costs, good surface sealing with the proper routine

maintenance, and a high resistance to wear.

Some of the first jobs done in the US are 9 years old now and show no signs of major distress and have received only routine crack sealing.

A first-ever demonstration project for Washington State was conducted on August 8th and 9th on SR17 within the City of Soap Lake. This project was approximately .71 miles in length, four lanes wide with 26,000 square yards paved. There was a very good turnout for this demonstration with 40 – 50 state and municipal personnel in attendance.

During the time I observed the paving, the material went down quickly and seemed to be very forgiving of pavement irregularities. I watched as traffic turned across the newly laid mix with no harm to the mat.

An additional demonstration project was done afterward for the Ada County Highway District in Boise, Idaho where 18,000 square yards were paved in one day between the morning and afternoon rush hours. The project was completed, striped and fully released to traffic by 4:00 PM, thus allowing commuters to drive home on a new and complete pavement surface without interruption, a big difference from what they drove to work on.

The WSDOT Materials Lab will be monitoring the performance of the new technique over the next few years. It will be interesting to follow this section of SR17 on a periodic basis to observe the short and long term performance of the pavement.

For additional information on the NovaChip process and the project performance, you can contact:
Jeff Uhlmeier, Pavement Engineer,
WSDOT Materials Lab
(360) 709-5485,
Uhlmej@wsdot.wa.gov. ▲

The Small City Pavement Preservation Program Roars to a Start!

By Bob Brooks, Pavement Technology Engineer, WST2Center, WSDOT

In July 2001, Washington State Department of Transportation, Highways & Local Programs sent out a call for projects for the Small City Pavement Preservation Program. The purpose of this program is to establish and

promote an on-going pavement maintenance program using a pavement management system designed to maintain the condition of streets in Washington small cities at an average pavement condition rating of 65. This is the optimum level to provide the most cost-effective pavement maintenance program through the application of low-cost, preventive

maintenance treatments. This program provides \$75,000 for cities with populations of 2500 or less to do preventative maintenance work on their street systems. The response has been overwhelming. All of the \$4.1 million available funding will be used to fund projects in 59 cities. ▲



USDOT Requests Papers on Current Technical Activities to Improve Transportation Security

By Ann Daniels, USDOT

The U.S. Department of Transportation is soliciting information and descriptions (White Papers), not to exceed five pages per project, of ongoing technical or project activity addressing areas of interest in:

- Risk and vulnerability assessment.
- Planning for transportation related contingencies.
- Innovative approaches to threat detection and evaluation.
- Reduction of vulnerabilities from critical infrastructure interdependencies.
- Innovative use of “smart technologies” to establish/assure the integrity of transportation physical infrastructure.
- Approaches to improving the robustness of the information infrastructure responsible for transportation operational controls.
- Advanced materials and structures to reduce the vulnerability of transportation vehicles or facilities to blast effects.
- Any other techniques or approaches to assuring the security and safe operation of transportation services.

The aim of this activity is to take necessary steps to identify promising technologies and concepts and to promote their expeditious implementation.

The intent of this announcement is to identify ongoing efforts currently funded by state and/or local governments, academic institutions, or the private sector intended to improve the security or reduce the vulnerability of transportation services to accidental or intentional disruption. The aim of this activity is to take necessary steps to identify promising technologies and concepts and to promote their expeditious implementation.

For more information visit:
http://www.rsps.dot.gov/cbd_baa0002.html. ▲

Tools to Combat Aggressive Driving Available

Regardless of location or population, the aggressive driver has probably moved into your community. The symptoms are uncomfortably familiar: speeding, running red lights or stop signs, tailgating and ignoring the safety of other motorists. Quiet back roads have become makeshift speedways and flashing headlights and honking horns are commonplace.

People view aggressive driving behavior as flagrant, unfair and dangerous, according to national focus groups. The National Highway Traffic Safety Administration (NHTSA), an agency of the U.S. Department of Transportation, defines it as, "the operation of a motor vehicle in a manner that endangers or is likely to endanger persons or property." Unchecked, aggressive driving behavior can result in road rage, which has been described as a form of criminal behavior where the car is used as a weapon against other drivers.

The public wants relief from the threat these motorists pose. According to a NHTSA survey, more than 60 percent of drivers consider unsafe driving by others a major personal threat to themselves and their families. Not surprisingly, 98 percent of respondents said it was important that something be done to reduce speeding and unsafe driving.

This disregard for safety has prompted the federal government to find ways to address the issue.

The NHTSA has produced materials specifically designed to help communities address the aggressive driving problem on a local level. These include:

■ **Stop Aggressive Driving Tool Kit** — Developed in response to state and congressional requests, this kit includes material appropriate for use by local and county governments: a brochure, pre-written editorials, suggested radio public service announcements, and camera-ready cartoons for placement in local newspapers, newsletters and magazines. All information is available in both English and Spanish.

■ **Aggressive Driving Prosecutors' Planner** — The power and influence of the prosecutor can make a significant impact on the battle to stop aggressive driving. Leading the community in the fight against dangerous drivers, prosecutors can encourage a zero tolerance policy for offenders within your jurisdiction. The Prosecutors' Planner provides tools to help the prosecutor educate the public about situations that precipitate aggressive driving behavior, including guidelines for appropriate penalties and sentencing.

■ **Aggressive Driving Enforcement: Strategies for Implementing Best Practices**

— This guide provides assistance to law enforcement to plan for an aggressive driving enforcement program and, secondly, to look at a number of successful programs that have been conducted around the country. Suggestions can be adopted or modified to fit any size law enforcement agency with any number of officers and the resources that are available.

■ **Aggressive Driving: Help Get the Word Out** —

Focusing on behavior of an aggressive driver, this piece is a straightforward way to help communities and individuals fight the problem. A 30-question "quiz" to help individuals evaluate their habits is included.

Perhaps it is time to confront the problems of aggressive driving in your community. NHTSA stands ready to be your partner in making highway safety a priority.

Contact Lorie Dankers at lorie.dankers@nhtsa.dot.gov, U.S. Department of Transportation, to obtain any of the free materials featured in this article. Her phone number is 206-220-7640. ▲

CD-ROM Developed by FHWA Wins Prestigious Audiovisual Award

A CD-Rom developed by the Federal Highway Administration (FHWA) to help improve pedestrian safety has received one of the highest honors in audiovisual competition from the International Film and Video Festival the Gold Camera Award for interactive multimedia.

"We are honored to receive this award for our work to improve pedestrian safety," U.S. Transportation Secretary Norman Y. Mineta said. "We must do more to integrate pedestrian safety needs into highway design and operations, and this

CD-Rom is a tangible result of our commitment to safety, President Bush's top priority for Department of Transportation."

Safer Journey – Interactive Pedestrian Safety Awareness is an interactive CD that takes the user through various pedestrian safety scenarios encountered on roads and streets to improve the level of pedestrian knowledge for all road users (including schools, driver education groups, enforcement, etc.) and people involved in advancing safety.

Leverson Boodlal, a highway engineer in FHWA's Office of Safety, was the program manager and developer of the CD-Rom. Avalon Integrated Services, a production company in Arlington, Va., produced the video.

Copies of this product can be obtained from the FHWA Office of Safety, 400 7th St. S.W., Washington DC 20590, telephone 202-366-2288, or email, leverson.boodlal@fhwa.dot.gov. For more information, visit http://safety.fhwa.dot.gov/programs/ped_bike.htm on the Internet. ▲

NHTSA's Traffic Safety Digest Provides Practical Safety Solutions

Would you like to find out what other communities are doing to improve traffic safety at the local level? Let the National Highway Traffic Safety Administration (NHTSA) give you some new ideas.

NHTSA publishes the Traffic Safety Digest, a quarterly publication that features 25 innovative traffic safety projects that have been or are currently being conducted around the country. This compendium includes brief, easy-to-read articles on pedestrian/

bicycle, safe communities, occupant protection, alcohol countermeasures and youth issues.

Each write-up includes problem identification, goals and objectives, strategies and activities undertaken, results and cost for the project. Contact information for the program manager is provided making follow-up simple.

There is no charge to receive the publication. It is available on the Internet at www.nhtsa.dot.gov/people/outreach/safedige or you can

add your name to the distribution list to receive hard copies in the mail.

Contact Lorie Dankers by e-mail at lorie.dankers@nhtsa.dot.gov, U.S. Department of Transportation, if you would like to receive the Traffic Safety Digest. Her phone number is 206-220-7640. ▲

Surfing the Web for OneDOT Information

Reprinted from Research & Technology Transporter, U.S. Department of Transportation, FHWA, March 2001, FHWA-RD-01-010

Publications aren't just available on bookshelves, there are a wealth of transportation-related publications available online. Whether you're searching for an FHWA, U.S. DOT, or State DOT publication, chances are the information is available on one of the Web sites listed below. These are only a few of the user-friendly electronic databases that are available at everyone's fingertips. You can also check FHWA's main Web site (www.fhwa.dot.gov) and FHWA's research, development, and technology Web site (www.tfhr.gov).

- <http://ntl.bts.gov/tris> — The Transportation Research Information Service (TRIS) database now has 500,000 records of published and on-going transportation research. It is (TRIS Online, Version 1.5) available to the public through the Bureau of Transportation Statistics National Transportation Library's Web site, and has abstracts of the research and some links to full-text documents.

- <http://ntl.bts.gov> — The National Transportation Library (NTL) has over 5,300 full-text documents and a search engine that indexes 110,000 documents from 14 transportation agencies. The NTL document collection includes U.S. DOT reports, transportation planning documents, and material from more than 30 State DOT's and university Web sites.

- <http://www.ntis.gov> — Even though the National Technical Information Service (NTIS) collection is large and varied, with nearly 3 million titles, you can easily browse through the collection for government-produced information from around the world. You can customize your searches to specific needs, and most items are available for purchase direction from NTIS. NTIS can also be reached at (703) 605-6000 or the toll-free number (800) 553-NTIS (6847) from 8 a.m. to 8 p.m. EST, Monday through Friday.



U.S. DOT librarians tap into the RIDER information network during a library training workshop held at TFHRC in October 2000.

- <http://isweb.tasc.doc.gov/Library/library.htm> — Through Research Information Databases and Electronic Resources (RIDER), the DOT Library offers hundreds of technical, scientific, legal, and business databases to DOT employees at their desktops. The system consists of three components: the DOT Online Catalog, Research and Reference Databases, and the Digital Special Collection.

*Zachary Ellis
(202) 493-3193
zac.ellis@fhwa.dot.gov*

Safety Performance of Rural Two-Lane Highways

Source: <http://safety.fhwa.dot.gov>

A report titled, "Prediction of the Expected Safety Performance of Rural Two-Lane Highways," that documents the algorithm for predicting the safety performance of rural two-lane highways is now available. The algorithm estimates the effect on safety performance of roadway segment parameters including lane width, shoulder width, shoulder type, horizontal curves, grades, driveway density, two-way left-turn lanes, passing lanes, and roadside design, and

of intersection parameters including skew angle, traffic control, exclusive left- and right-turn lanes, sight distance, and driveways. The algorithm enables roadway agencies to estimate the safety performance of existing or proposed roadways and to compare the safety performance of geometric design alternatives.

The algorithm forms the basis for the Crash Prediction Module of the Interactive Highway Safety Design Model (IHSDM). The software for the Crash Prediction Module

is currently under development. Beta testing of the software will begin in early 2002.

Please contact Michael Griffith at mike.griffith@fhwa.dot.gov or (202) 493-3316 to obtain a copy of the report. A PDF version of the report can be obtained at <http://www.tfhrc.gov/safety/99207.htm>. For general information about IHSDM, please contact Ray Krammes at ray.krammes@fhwa.dot.gov or (202) 493-3312.

**Did you know that in Washington last year
266 people died in alcohol-related crashes?**

That's 266 too many.

From December 14-16, law enforcement throughout Washington will conduct saturation patrols to remove impaired drivers from the state's roadways.

Please don't drink and drive.



A collaborative effort led by the U.S. Department of Transportation
For more information, visit www.nhtsa.dot.gov

Source: Fatality Analysis Reporting System, U.S. Department of Transportation



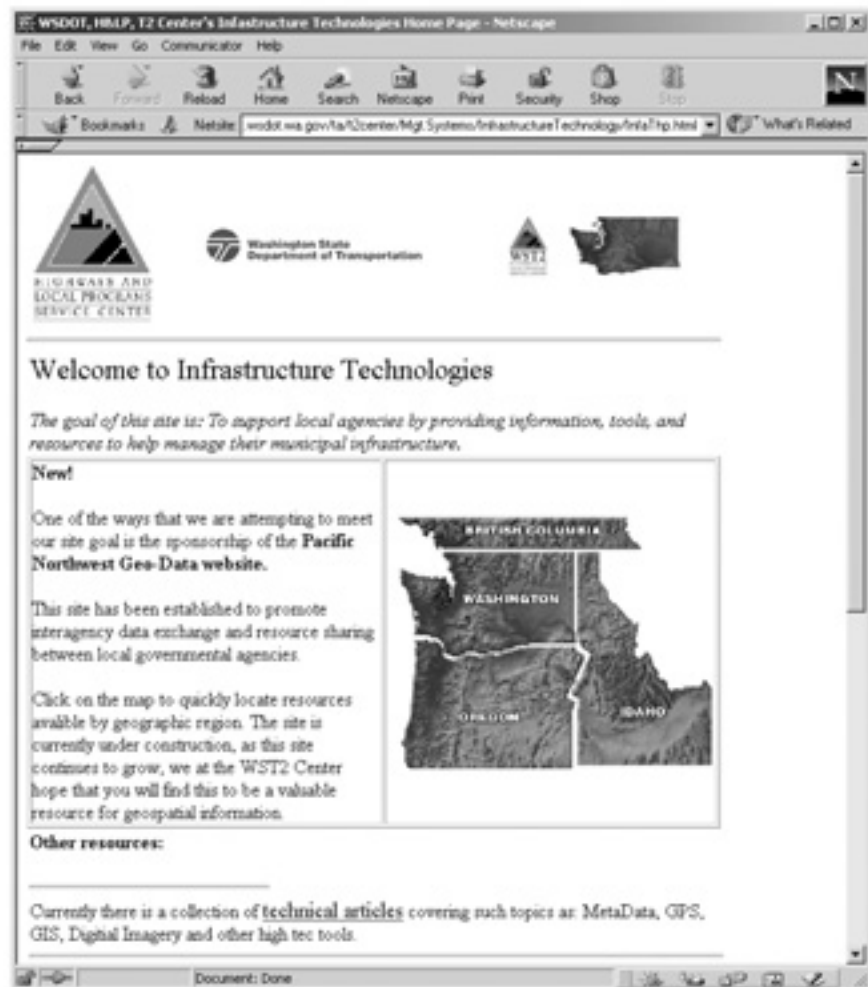
By Roger Chappell,
WST2
Technology
Integration
Engineer,
WST2 Center

The Pacific Northwest Geo-Data Website

In this issue I would like to highlight the Pacific Northwest Geo-Data Website that I spoke about in the last issue. I have been busy putting together a website where local agencies throughout the Pacific Northwest can go to find resources for geospatial data projects on a regional basis. In this fast paced world, local agencies are working hard to implement new technologies. Some are succeeding and some are falling farther and farther behind. This is what is being called the digital divide, the gap between the "haves" and "have -nots" of technology. With limited time and budgets many local agencies struggle just to keep up, let alone have the resources to invest in trying something new.

If this sounds like your agency or you feel you are reinventing the wheel and somebody "out there" must have the data or information you need, then this site may be for you.

As with any new project, this is a work in progress that will continue to evolve. It already contains many useful resources and is growing on a daily basis.



The Infrastructure Technologies Homepage



The "Geodata Web Links" page provides links to other web sites that may be of interest to the general geodata community.

I would like to start with a quick tour of the site. The first page is the Infrastructure Technologies Homepage, located at:

<http://www.wsdot.wa.gov/tat2center/Mgt.Systems/InfrastructureTechnology/InfThp.html>

There are four elements that I would like to highlight on this page. The first two are the navigation bars at the top and bottom of the page. These icons and text will be present throughout the site to help you navigate between the various pages and topics.

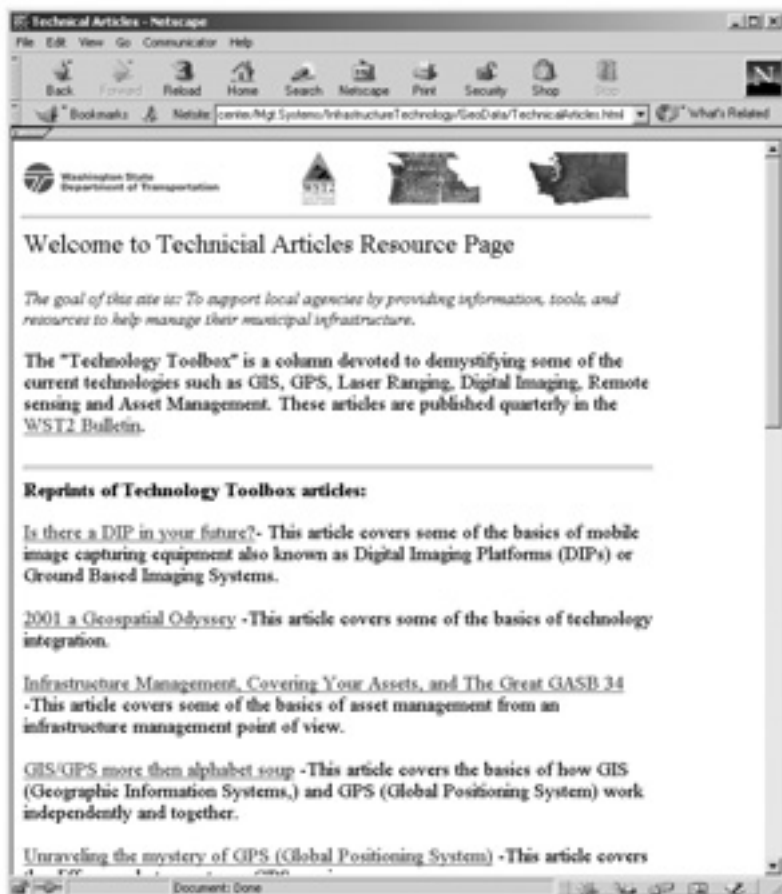
The next section I would like to highlight is titled "Other

Resources." This section will contain current grant opportunities and resources that affect the geospatial community throughout the Northwest. Before I move on, I would like to explain what I mean by "geospatial community". To me, this is the collection of individuals, groups, local, state and federal agencies that have an interest in, produce, or use geospatial data. This is data that can be tied to a geophysical location. In simplest terms, if you can put "it" on a map or tie "it" to some real world coordinate system, then your data is geospatial. This site was designed to help promote data exchange and provide resources for this geodata community.

To give you an idea, here are some topics that will be featured on this site:

- Various types of imaging (space, aerial, and ground based)
- GIS
- GPS
- Internet map serving
- Inventory systems
- Metadata

In the "Other Resources" section of this page there are two ongoing sections, the "Web Links" and "Technical Articles" sections.



The next section is titled “Technical Articles.” This will eventually contain a library of technical articles on the major subjects such as imaging, GIS, GPS, Internet map serving, inventory systems and Metadata. These articles will range from an overview of the subject matter to specific implementation procedures.

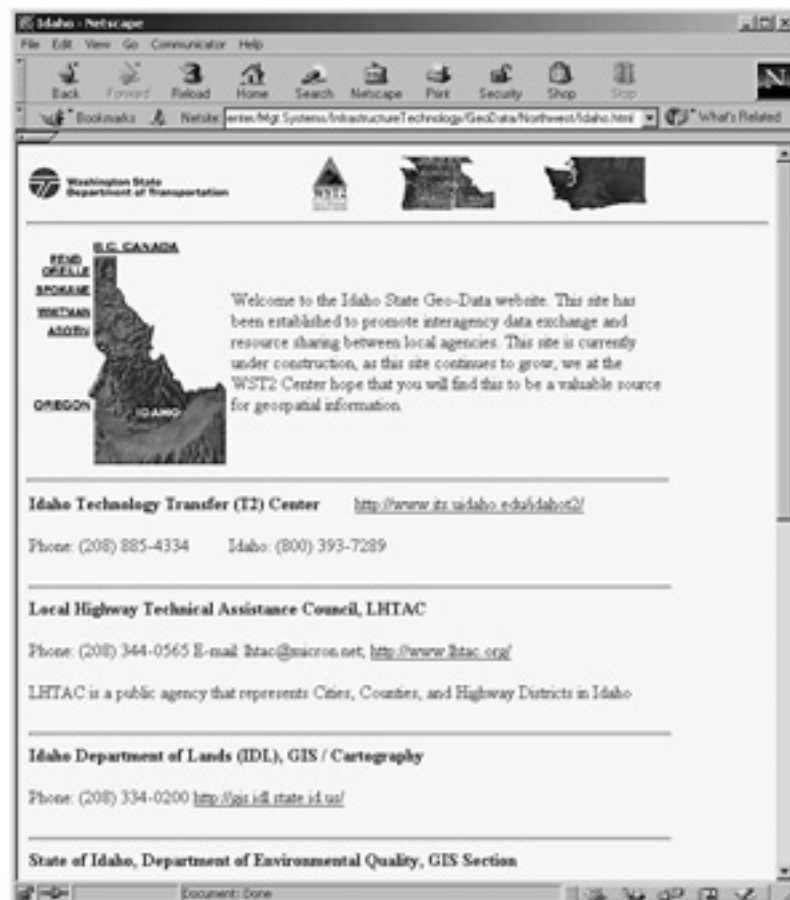
Lastly, I would like to explain the geodata map interface. Here you can click on a map to quickly locate resources available by geographic region. Resources, web links and grant opportunities will be located on their corresponding regional page.

(Left) The “Technical Articles” section provides articles of interest on major topics. (Bottom) The geo-data web page for Idaho contains links to agencies within that state.

The Web Links page contains a collection of web links pertaining to the topics previously listed. It is split into four sections:

1. WSDOT
2. Washington State
3. U.S.
4. Public

As this collection grows it will be modified to reflect the new topic areas. This section will contain web links of interest to the geodata community as a whole. Links and resources of interest at a regional level will be found by using the map interface.

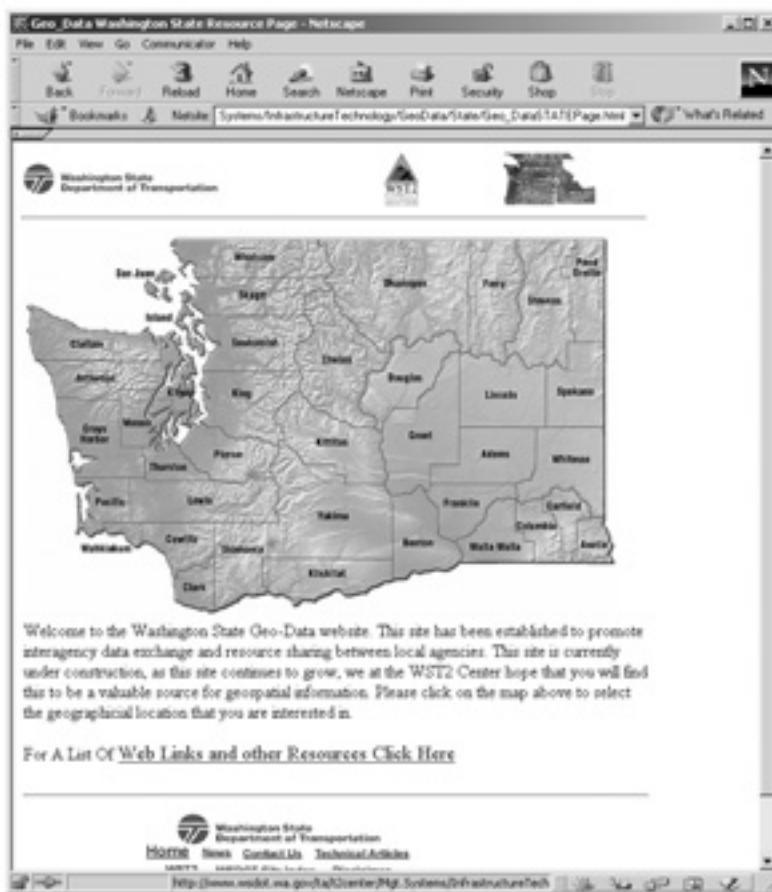


The Washington State map is further divided into counties. If there are grant opportunities, state wide projects, or other information of a statewide nature, they will be listed here.

At the county level, the site will contain projects, resources, and web links available in that county. If there is a project that crosses county boundaries, it will be listed in all counties that are affected. Since data collection can be a major expense in any project, our hope is that agencies will list projects for which they are seeking partners. GIS mapping, Aerial and space base imaging projects are good examples of the type of projects that will be listed.

(Right) With the State Map you can click on an individual county to find the resources within that county.

(Bottom) The geo-data web page for King County lists many useful sites located in King County.



On the top of each county page is a linked map so that you can easily navigate to bordering counties. There are also icons for the statewide and northwest map pages.

I hope you find this little tour helpful, and the tools and information you find on the web site valuable. This site was designed for your local agency and your participation in an ever-growing geo-data community. We at WST2 invite your participation and welcome your input as this site continues to evolve into a meaningful resource.

For participation or input into site development please contact:

Roger Chappell
Technology Integration Engineer
360-705-7539
chapper@wsdot.wa.gov



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This order form is available on the WSDOT Homepage at:
<http://www.wsdot.wa.gov/TA/T2Center/T2PUBS.htm>

Check the items you would like to order.

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|--|--|---|
| <input type="checkbox"/> 1999 Audio Visual Catalog, T2Center | <input type="checkbox"/> Gravel Roads – Maintenance and Design Manual, SD LTAP | <input type="checkbox"/> Local Low Volume Roads and Streets, ASCE, 1992 |
| <input type="checkbox"/> Asset Management Primer, FHWA, 1999 | <input type="checkbox"/> A Guide to the Federal-Aid Highway Emergency Relief Program, USDOT, June 1995 | <input type="checkbox"/> Maintenance of Aggregate and Earth Roads, WST2 Center (1994 reprint) |
| <input type="checkbox"/> Asphalt Pavement Repair Manuals of Practice, SHRP, 1993 | <input type="checkbox"/> A Guide for Local Agency Pavement Managers, NWT2 Center, 1994 | <input type="checkbox"/> Manual of Practice for an Effective Anti-icing Program: A Guide for Highway Winter Maintenance Personnel, FHWA, 1996 |
| <input type="checkbox"/> Comparison of Three Compactors Used in Pothole Repair, CRREL, 1984 | <input type="checkbox"/> A Guidebook for Residential Traffic Management, NWT2 Center, 1994 | <input type="checkbox"/> New Generation of Snow and Ice Control, FHWA |
| <input type="checkbox"/> Contracting for Professional Services in Washington State, MRSC, 1994 | <input type="checkbox"/> A Guide for Erecting Mailboxes on Highways, AASHTO, 1984 | <input type="checkbox"/> Pavement Surface Condition Field Rating Manual for Asphalt Pavement, NWPMA, WSDOT, 1999 |
| <input type="checkbox"/> Engineer's Pothole Repair Guide, US Army Corps of Engineers, CRREL, 1984 | <input type="checkbox"/> Highway/Utility Guide, FHWA 1993 | <input type="checkbox"/> Pedestrian Facilities Guidebook, WSDOT, 1997 (\$12.00 outside Washington State) |
| <input type="checkbox"/> Family Emergency Preparedness Plan, American Red Cross, et al. | <input type="checkbox"/> Improving Conditions for Bicycling and Walking, FHWA, 1998 | <input type="checkbox"/> Pothole Primer – A Public Administrator's Guide, CRREL, 1989 |
| <input type="checkbox"/> Fish Passage Through Culverts, FHWA, USDA, 1998 | <input type="checkbox"/> Improving Highway Safety at Bridges on Local Roads and Streets, FHWA, 1998 | <input type="checkbox"/> Rating Unsurfaced Roads, A Field Manual for Measuring Maintenance Problems, CRREL |
| <input type="checkbox"/> Fly Ash Facts for Highway Engineers, FHWA July 1986 | <input type="checkbox"/> Innovative Materials Development and Testing Volume 2: Pothole Repair, SHRP, NRC, 1993 | <input type="checkbox"/> Recommendations to Reduce Pedestrian Collisions, WSDOT, December 1999 |
| <input type="checkbox"/> Geotextile Selection and Installation Manual for Rural Unpaved Roads, FHWA - 1989 | <input type="checkbox"/> International State-of-the-Art Colloquium on Low-Temperature Asphalt Pavement Cracking, CRREL, 1991 | <input type="checkbox"/> Redevelopment for Livable Communities, Rhys Roth, Energy Outreach Center, 1995 |
| <input type="checkbox"/> Getting People Walking: Municipal Strategies to Increase Pedestrian Travel, Rhys Roth, Energy Outreach Center | <input type="checkbox"/> Local Agency Safety Management System, WSDOT, 1998, Reprinted 2000 | |

- Sidewalk Details, WSDOT, 2000
- State-of-the-Art Survey of Flexible Pavement Crack Sealing Procedures in the United States, CRREL, 1992
- Superpave System – New Tools for Designing and Building More Durable Asphalt Pavements, FHWA
- Traffic Calming: A Guide to Street Sharing, Michael J. Wallwork, PE, 1993
- Utility Cuts in Paved Roads, Field Guide, FHWA, 1997
- W-Beam Guardrail Repair and Maintenance, FHWA

Workbooks and Handouts from WST2 Center Workshops:

- Flagging Handbook, ATSSA, 1999
- Handbook for Walkable Communities, by Dan Burden and Michael Wallwork
- Highway Maintenance Welding Techniques and Applications, Tom Cook, Cornell Local Roads Program, 1995
- Historic and Archeological Preservation: An Orientation Guide, FHWA/NHI
- Planning and Implementing Pedestrian Facilities in Suburban and Developing Rural Areas, TRB
- Pavement Maintenance Effectiveness/Innovative Materials Workshop Participant's Handbook
- Snow & Ice Control Chemicals, Theory & Practice, Dale G. Keep, Ice & Snow Technologies, LLC,
- Wetland Evaluation Technique (WET), Volume II Methodology, U.S. Army Corps of Engineers, 1993

Non-Credit Self-Study Guides:

These non-credit self-study guides are available through WSDOT Staff Development, and may be obtained from the WST2 Center. An invoice will be sent with these non-credit course materials.

- Basic Surveying, \$20
- Advanced Surveying (metric), \$20
- Contract Plans Reading, \$25

- Technical Mathematics I, \$20
- Technical Mathematics II, \$20
- Basic Metric System, \$20

Computer Programs :

The following computer programs may be downloaded from the Internet at:

www.wsdot.wa.gov/TA/Operations/Environmental/Soft.htm

HyperCalc — A shareware utility for converting between metric and English units

APWA Cad Symbol Standards and Menus — A public domain program of standard AutoCAD symbols developed by the Washington Chapter of APWA for use with AutoCAD release 12.

Download the 2001 FileMaker Pro STIP program at www.wsdot.wa.gov/TA/STIP/STIP.HTM.

STIP Too Application (Version 5.4 – July 10, 2001) — This program enables you to manage your Six Year TIP (Transportation Improvement Plan) and send it to your MPO/RTPO and/or your Regional Local Programs Office for inclusion into the STIP (Statewide Transportation Improvement Program).

On Screen Forms:

- Progress Billing Form (Excel)
- Local Agency Agreement (Form 140-039)
- Local Agency Agreement Supplement (Form 140-041)
- Federal Aid Project Prospectus (Form 140-101)
- Environmental Classification Summary (Form 140-100)
- Bid Proposal Package
- Safety Management System Application
- BRAC Funding Application

Manuals Available on the WSDOT Website:

- A Local Agency Guide to Pavement Management/Streetwise Manuals
- The Local Agency Guidelines (LAG) Manual
- The Local Agency Safety Management System Manual

The following computer program may be downloaded from the Internet at: www.wsdot.wa.gov/fossc/mats/Apps/EPG.htm:

Everseries Pavement Analysis Programs: This series of programs contains three independent modules:

1. **Evercalc 5.0** – A FWD Pavement Moduli Backcalculation Program
2. **Everstress 5.0** – A Layered Elastic Analysis Program
3. **Everpave 5.0** – A Flexible Pavement Overlay Design Program

Important: These programs are updated on a regular basis. Please send your e-mail address to sivanen@wsdot.wa.gov to be included in the mailing list for updates.

The following computer program may be downloaded from the Internet at: www.wsdot.wa.gov/fossc/mats/pavement/fwd.htm:

FWD Area Program - This program is useful in calculating Normalized Deflections Area Value, and Subgrade Moduli from FWD Data. ▲

Washington State T2 Center

Contact: Wendy Schmidt or Laurel Gray
 phone: (360) 705-7386, fax (360) 705-6858
 web: www.wsdot.wa.gov/TA/T2Center/train2.htm

To register for a class in this category, use the contact listed above.

Fees shown in this section are for local agency/non-local agency.

LAG Training Program

LAG training is progressing. A number of classes have already been held. Others are scheduled (see below). Be sure to check out the web site

www.wsdot.wa.gov/TA/Operations/LAG/LAGprotrain.htm

where you can indicate your interest in any of the courses. It is important that you put your name on request lists. Classes will be scheduled according to indicated interest. **No fee.**

- **Qualified Testers:** This course will focus on the required testing procedures for NHS routes with Federal funding. Training is currently on hold.
- **Construction Documentation:** LAG Manual Chapters 51, 52, and 53. Classes scheduled for February 6, Vancouver; February 28, Tumwater; March 6, Yakima; March 12, Seattle; March 13, Seattle; April 25, Spokane.
- **Consultants** — LAG Manual Chapter 31. This training is being developed through WSDOT Consultant Services and TRANSPEED and should be available by spring 2002.
- **Disadvantaged Business Enterprise (DBE)/EEO/OJT:** LAG Manual Chapters 26 and 27. Classes planned for January or February 2002.
- **Design Standards from PS&E to Award.** LAG Manual Chapters 42-46.
- **Emergency Relief Programs.** Chapter 33 of the LAG Manual.
- **Enhancement Program.** LAG Manual Chapter 62.
- **Environmental/Advanced — Endangered Species Act:** LAG Manual Chapter 24.
- **Environmental/Introduction.** LAG Manual Chapter 24.

- **Funding Workshop:** LAG Manual Chapters 12, 21, 22, and 23. Agreements and supplements, prospectus, progress billings.
- **Right of Way Procedures Workshop** — LAG Manual Chapter 25 and the Federal Perspective. Some classes have already been held. More will be scheduled in 2002.
- **LAG Manual Overview.**
- **Railroad Procedures.** LAG Manual Chapter 32.
- **Section 106 Process-National Historic Preservation Act of 1966:** LAG Manual Chapter 24.

MUTCD Millennium Edition State Adoption Process

January 23, Yakima; January 24, Spokane; January 30, Seattle; January 31, Vancouver. **No fee.** These will be meetings to solicit modifications to the Millennium Edition of the MUTCD. Agenda for the meetings include: (1) Introduction, (2) Overview of Adoption Process, (3) Brief overview of major changes to Millennium Edition MUTCD, (4) Opportunity for local agencies to propose modifications.

Contract Plans, Specifications, and Estimate Preparation (PS&E)

January 23-24, Seattle; March 20-21, Wenatchee; April 24-25, Bremerton; September 24-25, Vancouver; October 15-16, Bellevue; November 12-13, Tacoma. **\$75/150.** This two-day class covers the preparation of PS&E by WSDOT, consultants, and local agency staff. Instruction will be based on the Plans Preparation Manual as well as other references. The course includes contract special provision writing. It will cover the most recent requirements for preparing complete, biddable, constructable, and defensible plans, and the most recent requirements for writing complete, concise, and well-formatted special provisions.

Stream Stability and Scour at Highway Bridges (NHI)

January 29-30, Tacoma. **\$345/445.** This class provides comprehensive training in the prevention of hydraulic related failures of highway bridges. The effects of stream instability, scour, erosion and stream aggradation and degradation are covered. An overview of countermeasures to these problems is provided. Course material, based on HEC-18, includes revisions made to the contraction scour procedure, modification of the pier scour equation to account for the armoring effect of larger particle sizes in the bed material, and the design of riprap for protecting abutments. Material for the course comes primarily from two Hydraulic Engineering Circulars (HEC), "Evaluating Scour at Bridges" (HEC-18), and "Stream Stability at Highway Structures" (HEC-20). For hydraulic, structural and geotechnical engineers and bridge inspectors responsible for maintaining the integrity of highway bridges against possible hydraulic related problems.

Bridge Condition Inspection Update (BCIU)

February 6-7, Tacoma; February 20-21, Ellensburg. **Free.** This course will provide information on the inspection manual and updates, laptop bridge inspections, load ratings and permitting and other important bridge inspection issues.

Bridge Condition Inspection Fundamentals (BCIF)

February 12-14, Tacoma. **Free to local agencies in WA State/\$150 to all others (BCIT may be taken for same price).** This course is designed to provide basic knowledge of the concepts of bridge condition inspection, materials, material properties, bridge components and details, loadings, stresses and strains, and deterioration of bridge materials and members. This training is intended to provide federal, state and local technicians, inspectors and engineers who have little or no background in bridges with a basic knowledge of bridges and bridge inspection skills.

Bridge Condition Inspection Training (BCIT)

March 4-8 and March 11-15. **Free to local agencies in WA State/\$150 to all others (BCIF may be taken for same price).** This two-week course is based on the "Bridge Inspector's Training Manual 90" and will provide extensive training on the condition inspection of in-service bridges. Satisfactory completion of this course will fulfill the training requirements of the National Bridge Inspection Standards (NBIS) for "a comprehensive training course" based on the manual. The training course will cover: bridge inspection programs; review of basic concepts; safety; inspection documentation; inspection and evaluation of bridge decks, common timber, steel and concrete superstructures and substructures, waterways, fracture critical bridge members, underwater inspections, and culvert inspection. For new bridge inspectors or those desiring a refresher. Should have general understanding of bridges.

Work Zone Traffic Control for Maintenance Operations on Rural Highways (NHI)

April 22, Federal Way; April 24, Kennewick; April 25, Moses Lake. **\$150/250.** This course provides guidance and training for field personnel, such as maintenance crews, survey crews, and utility crews working in the planning, selection, application, and operation of short-term work zones.

Access Management, Location & Design (NHI)

April 29-May 1, Tacoma. **\$345/445.** This course covers access management along streets and highways. General benefits, as well as the social, economic, political and legal implications of access control are examined. Existing access management practices and policies from sample states and jurisdictions are used as examples of what types of programs have been initiated and how effective they have been. Through in-depth discussion, access management techniques and the warrants for their use are reviewed. Geometric standards and guidelines for design and application of these access management techniques are described in detail. Strategies for developing and implementing retrofit programs to improve existing access control are presented. Safety and operations techniques and procedures are also covered.

Cultural Resources Workshop

April 30-May 3 and October. The Dalles, Oregon. **\$325.** Cultural Resources training takes place twice a year in the spring and fall and is sponsored by WSDOT's Environmental Affairs Office/Cultural Resources along with State Parks and Recreation Commission and Office of Archaeological and Historic Preservation. The goal is to introduce the participant to the value and significance of Washington's irreplaceable cultural resources. There will be presentations by Native Americans on their cultural perspective, speakers on state archaeology, prehistory of Washington, Native American ethnobotany, prehistoric stone artifacts, rare plants, logging in the northwest, federal and state cultural resource regulations and how they apply to your agency. There will be in-field lessons on learning how to "read" the landscape and recognize the probable cultural resources located at a field site.

Pavement Condition Rating Workshop

May 14-15, Ellensburg; June 11-12, Tacoma. **\$45/90.** Instructor: Bob Brooks. Participants will learn to rate any of the pavements commonly found in Washington. The rating values obtained using the definitions and methods learned in this course should compare favorably with those obtained and used in the Washington State Pavement Management System. Each participant will learn to perform a pavement condition survey with reasonable objectivity.

Basics of a Good Gravel Road

Instructor Bill Heiden will be presenting four sessions in May. **\$35/70.** This is a basic road maintenance class. All major problems of unpaved gravel roads will be addressed: washboarding (corrugation), traffic patterns, rutting, surface drainage, dust control, surface material, and roadside obstructions. Mr. Heiden believes that using the techniques he teaches will reduce unpaved road maintenance expenditures up to 40 percent or less of current expenditures in three to five years. If your agency would like to host a session, please call the WST2 Center.

Traffic Control Software and Signalization (NHI)

May 8-9, Tacoma. **\$280/380.** This course provides participants with skills to evaluate the process by which signal control projects are developed, designed, implemented, maintained, and operated. The course addresses the application of the Manual on Uniform Traffic Control Devices to intersection displays, as well as signal timing, computerized traffic signal systems, control strategies, integrated systems, traffic control simulation and optimization software. The course is divided into three parts: traffic signal design, traffic signal systems, and traffic software.

The Endangered Species Act (ESA) Training Program

The Regional Road Maintenance ESA Program Guidelines are continuing through the approval process. A final decision on approval is anticipated in December followed by a review period. In order to be prepared, T2 has been seeking funding for implementation and formulating a plan for presenting the eight courses to public agencies. The 8 courses have been grouped into 4 tracks to aid in the efficiency and consistency of the training presentation. Here is a list of the original courses and how this material is now organized and planned to be offered:

Course Plan and Proposed Learning Objectives

- **ESA 100 “Briefing for Decision Makers”** 2 hours. An overview of the Regional Road Maintenance ESA Program and its benefits to participating agencies.
- **ESA 101 “Introduction to the Regional Road Maintenance ESA Program”** 4 hours. For all trainees. This class is a prerequisite for ESA 102-107. Includes an overview of the program:
 - Habitat and the Law
 - The 10 Elements of the Regional Program
 - Introduction to the Guidelines
- **ESA 102 “Outcome-based Road Maintenance for Field Crews”** 8 hours. Instruction in using the Guidelines. Applied exercises in using Guidelines to make informed decisions in the field.
- **ESA 103 “Design and BMPs with the Regional ESA Program Guidelines”** 8 hours. Instruction in how to use the Guidelines in multi-disciplinary teams that design, install, monitor, maintain, and remove BMPs. Applied exercises in using the Guidelines for road maintenance design.
- **ESA 104 “Monitoring for the Regional Program”** 4 hours. Detailed instruction in the two types of monitoring required under the Regional Program. Applied exercises in monitoring.
- **ESA 105 “Environmental Roles and Responsibilities”** 4 hours. Detailed instruction in the role of permitting and other environmental issues.
- **ESA 106 “Train the Trainer: Teaching the Regional Program”** 8 hours. Instruction in applying the Regional Road Maintenance ESA Program Guidelines. Includes overview of training materials and adult learning techniques. Coaching and applied exercises.
- **ESA 107 “Train the Trainer: Field Application of BMPs”** 8 hours. Instruction in field training techniques using the Regional Program Guidelines. Morning session includes instruction in tools and techniques for teaching BMPs. Afternoon session covers field practice applying techniques. Includes coaching and peer evaluation.

The Four ESA Training Tracks

During the development of the ESA courses, an implementation plan evolved to form the training into various training tracks. The complete ESA Training Plan has been grouped into four tracks: Briefing for regional level decision makers, a training course addressing office and technical procedures involved in roadway maintenance activities, a training course that addresses the field procedures and practices involved in roadway maintenance activities, and courses that develop agency level trainers who are selected by those agencies desiring in-house training capability.

The purpose of the consolidation is to shorten the time agency personnel would be involved in training and to present the training in an “operational teamwork” environment. The training also is intended to emulate, where appropriate, team approaches most agencies could or do employ on roadway maintenance and operational activities. The ultimate objective is to provide consistent training packages to train agency office and field crews, staff, supervisors, and managers on procedures meeting the requirements of ESA for application to roadway maintenance.

The ESA Training Plan Tracks are as follows:

- **Track 1: Briefing for Regional Decision Makers** 2 hours. Minimal fee. An overview of the ESA program for Regional level management and administration. To be offered at conferences and other public events, and as a continuing part of the T2 training program, on an as-needed basis.
- **Track 2: (Consolidates 101, 103, 104, 105: Introduction, Design and BMP's, Monitoring, and Environmental Roles)** 2 1/2 days. \$200 per person. This course is the combination of the various office procedures for technical, professional and scientific staff, supervisors and leads involved in addressing operational maintenance activities to meet ESA requirements. The University of Washington's TRANSPEED program is ready to offer a series of these classes around the state.
- **Track 3: (Consolidates 101, 102: Introduction and Outcome-based Road Maintenance)** 8 hours. Fee not determined. This is the track for field crews and leads. An implementation plan has not been determined yet.
- **Track 4: (Consolidates 106, 107: Train-the Trainer Program)** 2 or 3 days of training. Fee not determined. For agency-selected ESA trainers. This track will be presented by the University of Washington's TRANSPEED program. The University will certify the students who will be instructors. Each participant who seeks certification must have taken Tracks 2 and 3 prior to being enrolled in this training. (students do not need to take the 100 course).

Associated General Contractors of Washington

Contact: David Hymel
phone: (206) 284-4500
fax: (206) 284-4595
web: www.agcwa.com

*To register for a class in this category,
use the contact listed above.*

Construction Site Erosion and Sediment Control Certification

January 9-10, Seattle; January 23-24, Lacey; February 6-7, Kent; February 20-21, Yakima; March 6-7, Seattle; March 27-28, Everett; April 10-11, Kennewick; April 24-25, Shoreline; May 9-10, Tacoma; May 22-23, Seattle. \$250. This is a WSDOT endorsed class. Classes can be presented for individual agencies. See the above web site for additional information.

University of Washington

Engineering Professional Programs (EPP)

phone: (206) 543-5539
fax: (206) 543-2352
web: www.engr.washington.edu/epp

*To register for a class in this category,
use the contact listed above.*

The following is a listing of TRANSPEED, PEPL and EPP classes. All three programs comprise the Engineering Professional Programs at the University of Washington's College of Engineering. For dates and costs that are not shown, check the above web site for updated information.

Managing Scope, Schedule and Budget

January 9-11 \$645/\$45 Spokane

Advanced Highway Capacity

January 23-25, \$360/\$460 Seattle

Construction Inspection of Public Works Projects

January 28-29 \$220/\$400 Spokane

Public Works Construction Project Management

January 31-February 1 \$300/\$480 Spokane

Manual on Uniform Traffic Control Devices-Revised Course!

February \$265/\$465 Seattle and Olympia

Reliability Centered Maintenance

February 2002 (dates to be announced) 8:30 AM - 4:30 PM
8:00 AM - 5:00 PM

Effective Writing for Technical Professionals

February 20, 25, 27, March 4, and March 6. Seattle. \$390.

Stormwater Treatment: Chemical, Biological and Engineering Principles

February 20 and 21, Seattle. \$495.

Storm and Surface Water Monitoring

March, Seattle. Fee to be announced.

Construction Erosion Control

May, Seattle. Fee to be announced.

Engineering Refresher Courses

FE/E.I.T. Exam Review Course

February 11 - March 25, 2002. \$425/495.
Monday & Wednesday, 6:30 - 9:00 PM

Mechanical PE Exam Review Course

February 19 - March 28, 2002. \$525/595.
Tuesday & Thursday, 6:30 - 9:00 PM

Civil PE Exam Review Course

February 26 - April 2, 2002. \$445/515.
Tuesday & Thursday, 7:00 - 9:30 PM

Fleet and Shop Management Classes:

Costs for the following 3 classes:

\$349 for one session

\$590 for 2 sessions

\$735 for 3 sessions

Fleet Facility Maintenance & Design

Thursday, March 28. 8:00 AM - 5:00 PM

Vehicle Fleet Management

Friday, March 29. 8:00 AM - 5:00 PM

Effective Shop Management

Saturday, March 30

Conferences & Meetings

CenterLine Pavement Management Conference

January 22-24, 2002, Ellensburg.

Contact: MRC at (253) 851-3200 for information or to register.

APWA Spring Conference

March 26-29, 2002, Skamania Lodge, Stevenson, WA.

For Information: (509) 427-7700, 1-800-221-7117, or
Event Solutions (541) 928-5055.

Road Builders' Clinic

March 5-7, 2002, Coeur d'Alene, Idaho.

Contact: Kelly Newell at Washington State University
phone: 1-800-942-4978

PNS Snowfighters' Conference

June 3-5, 2002, Boise, ID.

Contact: Dave Jones (208) 332-7893 (Idaho)
or Clay Wilcox (360) 874-3050 (WA)
web: www.wsdot.wa.gov/fossc/maint/pns

Road and Street Maintenance Supervisor's School

East Side: October 1-3, 2002; West Side: December 3-5, 2002,
Tacoma.

Contact: Kelly Newell at Washington State University
phone: 1-800-942-4978



December 4, 5 & 6, 2001
WestCoast Hotel @ Capitol Lake • Olympia, Washington

Guest Speaker:
Gordon Graham
Graham Research Consultants, Long Beach, California

The annual Traffic Safety Awards ceremony will be December 6.
For more information, please call the Washington Traffic Safety Commission at (360) 753-6197.

WSDOT Local Programs Engineers

Eastern Region (Spokane)

Brent Rasmussen (509) 324-6080, RasmusB@wsdot.wa.gov

Northwest Region (Seattle)

Terry Paananen (206) 440-4734, PaananT@wsdot.wa.gov

Olympic Region (Olympia)

Mike Horton (360) 357-2666, HortonM@wsdot.wa.gov

North Central Region (Wenatchee)

Stan Delzer (509) 667-3090, DelzerS@wsdot.wa.gov

South Central Region (Yakima)

Roger Arms (509) 577-1780, ArmsR@wsdot.wa.gov

Southwest Region (Vancouver)

www.wsdot.wa.gov/regions/SouthWest/localprograms/

Bill Pierce (360) 905-2215, PierceB@wsdot.wa.gov

Legal Search

Search RCW's and WAC's:

<http://search.leg.wa.gov/pub/textsearch/default.asp>

Traffic Technology

National Highway Traffic Safety Administration

www.nhtsa.dot.gov

WSDOT Traffic Data Office

www.wsdot.wa.gov/ppsc/TDO/tdo_hp.htm

Washington State Patrol

www.wa.gov/wsp/wsphome.htm

Washington Traffic Safety Commission

www.wa.gov/wtsc

American Traffic Safety Services Association

www.atssa.com

Municipal Research and Services Center of Washington

www.mrsc.org

Transportation Research Board

www.nas.edu/trb/index.html

Training

American Public Works Association

www.apwa.net/education

County Road Administration Board

www.crab.wa.gov/pubs/catalog.pdf

Washington State Technology Transfer Center

www.wsdot.wa.gov/TA/T2Center/TRAIN2.HTM

LAG training site

www.wsdot.wa.gov/TA/Operations/LAG/Lagtrain.HTM

FHWA's pedestrian workshop available free of charge:

www.ota.fhwa.dot.gov/walk/index.html

Transportation Partnership in Engineering Education Development (TRANSPED)

<http://www.wsdot.wa.gov/ppsc/research>

Pavement Management

NWPMA – Northwest Pavement Management Association:

<http://www.wsdot.wa.gov/ta/T2Center/Mgt.Systems/PavementTechnology/nwpma.html>

Asphalt Institute:

<http://www.asphaltinstitute.org/>

National Asphalt Pavement Association:

<http://www.hotmix.org/>

Pavenet (a web site for Managing Pavements):

<http://www.mincad.com.au/pavenet/>

SuperPave information:

<http://www.utexas.edu/research/superpave/>

Infrastructure Management and GIS/GPS:

*This site has been established to promote interagency data exchange and resource sharing between local governmental agencies.

<http://www.wsdot.wa.gov/TA/T2Center/Mgt.Systems/InfrastructureTechnology/InfThp.html>

Environmental

Regional Road Maintenance Endangered Species Act Program Guidelines:

www.metrokc.gov/roadcon/bmp/pdfguide.htm

National Marine Fisheries Service's home page:

www.nwr.noaa.gov

National Marine Fisheries Service Species Listings & Info:

<http://www.nwr.noaa.gov/1habcon/habweb/listnwr.htm>

U.S. Fish and Wildlife Service's home page:

www.endangered.fws.gov

US Fish & Wildlife Service Species Listings & Info:

<http://endangered.fws.gov/>

Washington State DNR's Natural Heritage Program home page:

www.wa.gov/dnr/htdocs/fr/nhp/refdesk/fsrefix.htm

FHWA's Environmental home page:

www.fhwa.dot.gov/environment/genrlenv.htm

Bridge

WSDOT Highways and Local Programs:

<http://www.wsdot.wa.gov/TA/Operations/BRIDGE/BRIDGEHP.HTM>

Research

WSDOT Research Office:

<http://www.wsdot.wa.gov/ppsc/research>

Looking for a transportation research publication?

<http://www.nas.edu/trb/index.html>

Municipal Research and Services Center of Washington

<http://www.mrsc.org/>

Other Resources

LTAP (Local Technical Assistance Program) Clearing House:

<http://www.ltapt2.org/data.htm>

Institute of Transportation Engineers:

www.ite.org

FHWA's new pedestrian sites, with great information including design:

www.walkinginfo.org

www.bicyclinginfo.org

WSDOT pedestrian safety demonstration project in Shoreline:

www.otak.com/shorelinepedsafety

Washington State Counties:

<http://access.wa.gov/government/awco.asp>

Washington State Cities and Towns:

<http://access.wa.gov/government/awcity.asp>

Governor's Office of Indian Affairs, Washington State Tribal Directory:

<http://www.goia.wa.gov/directory/toc.html>

Highways and Local Programs List Serves

Local Agency Guidelines (LAG) manual:

http://lists.wsdot.wa.gov/guest/RemoteListSummary/LAGG_L

Traffic and Safety Management:

http://www.lists@lists.wsdot.wa.gov/guest/RemoteListSummary/T2SMS_L

Pavement Management:

http://lists.wsdot.wa.gov/guest/RemoteListSummary/T2PAVE_L

WSTS Newsletter:

http://lists.wsdot.wa.gov/guest/RemoteListSummary/T2News_L

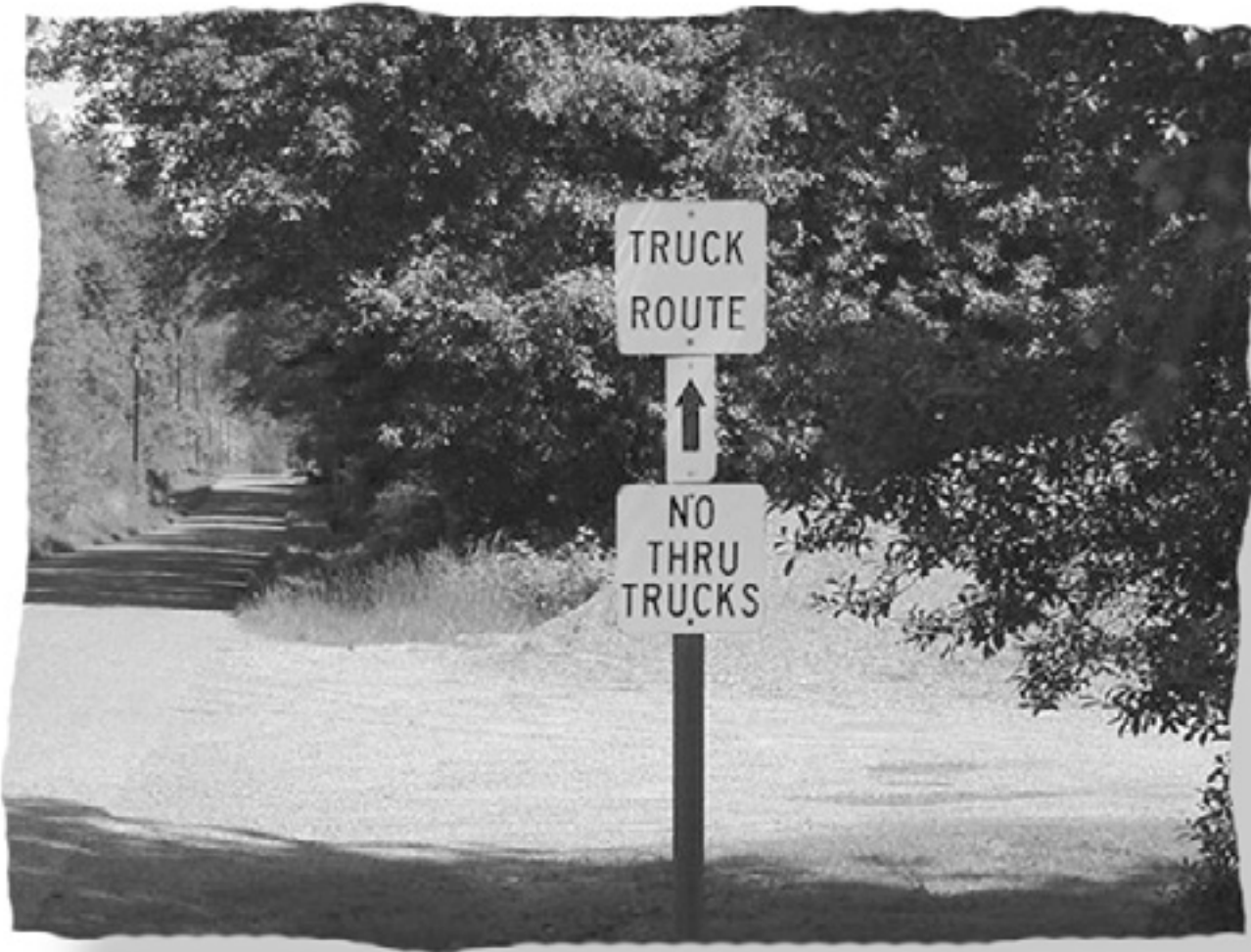
Training:

http://lists.wsdot.wa.gov/guest/RemoteListSummary/T2TRNG_L

Web Technologies Interest Group:

<http://WTIG-L@lists.wsdot.wa.gov>





Can't get there from here!

Given Kutz, Traffic Engineering Technician, Skagit County Public Works, came across this one near Guemes Island in Skagit County. Given says, "Guemes is only accessible via a county-operated ferry from Anacortes. No one has claimed responsibility. When I saw it, I laughed so hard I almost ran off the road. This picture was taken 6/2/00. It has since been corrected."

Sign of the Times

Do you have a humorous traffic sign to share? Send us a print or e-mail a digital image (preferably a 300 dpi, 1000 x 1500 dpi jpg or tiff) and we will add it to our collection for publishing. Please provide your name, title, agency or company, and a short description of where and when you saw the sign. We want to give you credit for your participation. You can e-mail the image to SundeD@wsdot.wa.gov or mail the photo to:

"Sign of the Times"
WST2 Center
PO Box 47390
Olympia, WA 98504-7390



Please don't send your original photo. Although we will do our best to return the photo, we can't guarantee it.

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WST2 Web Site

www.wsdot.wa.gov/TA/T2Center/T2hp.htm

Toll Free Training Number

1-800-973-4496

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